REPORT RESUMES

ED 002 946 24
SELF-CONCEPT OF ABILITY AND SCHOOL ACHIEVEMENT, THE
RELATIONSHIP OF SELF-IMAGES TO ACHIEVEMENT IN JUNIOR HIGH
SCHOOL SUBJECTS.
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REPORT NUMBER CRP-845 PUB DATE 62
EDRS PRICE MF-$0.18 HC-$4.48 112P.

DESCRIPTORS- *SELF CONCEPT, GRADE 7, *SELF EVALUATION, *COGNITIVE ABILITY, *ACADEMIC ACHIEVEMENT, LEARNING, *INTELLIGENCE QUOTIENT, SEX DIFFERENCES, FAMILY BACKGROUND, JUNIOR HIGH SCHOOL, HIGH ACHIEVERS, LOW ACHIEVERS, OVERACHIEVERS, UNDERACHIEVERS, EAST LANSING, MICHIGAN

VARIOUS EXPERIMENTAL EVIDENCE HAS SHOWN THAT SELF-CONCEPT OF ABILITY IS RELATED TO SCHOOL ACHIEVEMENT AND IS CAPABLE OF MEASUREMENT. A SELF-CONCEPT OF ABILITY SCALE WAS DEVELOPED IN TWO FORMS--(1) GENERAL SELF-CONCEPT OF ABILITY AND (2) SELF-CONCEPT OF ABILITY IN SPECIFIC SCHOOL SUBJECTS. MAJOR RESULTS OF THE STUDY REVEALED THAT (1) SEVENTH-GRADE GIRLS HAD SIGNIFICANTLY HIGHER MEAN SELF-CONCEPT OF ABILITY SCORES THAN SEVENTH-GRADE BOYS, (2) SELF-CONCEPT OF ABILITY WAS SIGNIFICANTLY RELATED TO SCHOOL ACHIEVEMENT OF SEVENTH-GRADE BOYS AND GIRLS (THE CORRELATION WAS .57 FOR EACH SEX), (3) SELF-CONCEPT OF ABILITY WAS POSITIVELY RELATED TO SCHOOL ACHIEVEMENT IN THE SEVENTH GRADE WHEN MEASURED INTELLIGENCE WAS CONTROLLED, (4) THE CORRELATION BETWEEN SELF-CONCEPT OF ABILITY AND MEASURED INTELLIGENCE WAS .46 FOR BOYS AND .48 FOR GIRLS, AND (5) SELF-CONCEPT OF ABILITY IN FOUR SPECIFIC SCHOOL SUBJECTS WAS RELATED TO SEVENTH-GRADE ACHIEVEMENT IN THOSE SUBJECTS TO APPROXIMATELY THE SAME DEGREE THAT GENERAL SELF-CONCEPT TO ABILITY WAS RELATED TO ACHIEVEMENT IN THE FOUR SUBJECTS COMBINED. THE REPORT CONCLUDED THAT SELF-CONCEPT OF ABILITY FUNCTIONS INDEPENDENTLY OF MEASURED INTELLIGENCE IN PREDICTING SCHOOL ACHIEVEMENT. EXPERIMENTAL TREATMENTS DESIGNED TO ENHANCE A STUDENT'S SELF-CONCEPT OF ABILITY AND THUS IMPROVE HIS SCHOOL ACHIEVEMENT ARE BEING UNDERTAKEN IN COOPERATIVE RESEARCH PROJECT 1636 (ED 003 294) ENTITLED, "IMPROVEMENT OF ACADEMIC ACHIEVEMENT THROUGH STUDENTS' SELF-CONCEPT ENHANCEMENT." (TC)

ED002946

845

Cooperative Research Project 845
December 1962

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Self-Concept of Ability and School Achievement

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Michigan State University
East Lansing, Michigan

Self-Concept of Ability and School Achievement

Final Report
of
Cooperative Research Project No. 845

entitled

The Relationship of Self-Images to Achievement in Junior High School Subjects

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Shailer Thomas

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1962

The research reported herein was supported
by the Cooperative Research Program of the
Office of Education, U. S. Department of
Health, Education, and Welfare

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PREFACE

In order to recognize both Ann Paterson and Shailer Thomas for their major roles in the project they join the principal investigator as authors of this report.

Mrs. Paterson assumed direct responsibility for the day to day operations and contributed significantly in the design and the analysis of the data. During this project she served first as a graduate research assistant and subsequently as a research associate. A major part of the manuscript was written in its original form by Mrs. Paterson. Some portion of the research reported herein may be submitted as a doctoral dissertation by Mrs. Paterson.

Mr. Thomas served as graduate assistant on this project and assumed a significant role in analysis of the data and preparation of the report. He continues to have a major responsibility for the second phase of this research program.

This project was made possible by the cooperative support of the U.S. Office of Education, Michigan State University and the "Oldtown" school system. Original and supplementary grants by the Cooperative Research Branch of the U.S. Office of Education provided a major portion of the financial support. Equally essential were support and facilities provided by Michigan State University and continued assistance of many colleagues here. The participation of the students of "Oldtown" junior high schools and the cooperation of the administration and teachers in this school system were also necessary.

We trust that our personal expressions of appreciation have and will continue to be acceptable recognition for the many people who contributed to the success of the study.

Although Mrs. Paterson, Mr. Thomas, and many other colleagues have made significant contributions to the quality of the study, the final responsibility rests with the principal investigator. Any inadequacies or errors are his.

College of Education
Michigan State University
East Lansing
December 1962

Wilbur B. Brookover
Principal Investigator

CHAPTER 1

The Problem

The twentieth century demands people with high levels of both general and technical education. Moreover, this demand for the well educated is increasing rapidly. Tomorrow the lowest acceptable level of education and competence will in all likelihood be above what it is today. In the future, then, it will be necessary to raise our educational base. At the same time, the increasing demand for these better trained individuals will result in our having to educate a relatively greater proportion of our people to this higher level.

One basic assumption of twentieth century educational practice in the United States is that only a limited proportion of American youth is capable of high level educational effort. Conant assumed that only 15% - 25% of our high school youth can profit by education in mathematics, science and foreign languages. (1)

If this assumption is true, it leads directly to a serious dilemma. On the one hand, we shall need an increasing proportion of people with more education than is common today. On the other hand, our assumption claims that only a relatively constant proportion of our population is capable of high level learning. Faced with this dilemma we have sought to identify a maximum percentage of those children who presumably have the "gifts" necessary to learn more advanced academic subjects and have selected them for higher levels of education. We have, however, done little to explore the possibility of developing the ability of the remaining 75% to 85% so that more of them have an opportunity to learn the more advanced or difficult areas of knowledge.

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(1) James B. Conant, The American High School Today (New York: McGraw-Hill Book Company, 1959), p. 20.

The Russians make a contrary assumption from us. In commenting on the last three years of the Russian ten-year education program which includes heavy emphasis on mathematics, physics, chemistry, biology, literature and foreign language, Chauncey says, "This, clearly, is a stiff academic program, yet the Russians expect 99% of their students to take it, profit from it, and complete it. . . . To what extent are they able to get 99% of their students through a program of this nature?" Although he was unable to secure complete data to answer the question, he estimates that "somewhere between 50 and 80 per cent of Russian students actually get through the ten-year school program." (2)

Although we recognize that innate factors may set limits to learning ability, we also recognize that few people achieve anywhere near this level set by innate capacity. We, therefore, have investigated one factor that may functionally limit the learning of many students and thereby prevent them from working at their maximum level. This is the student's self-concept of his ability as a school learner. (3)

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(2)Henry Chauncey, "Some Observations on Soviet Education," Proceedings of the 1958 Invitational Conference on Testing Problems (Princeton, New Jersey: Educational Testing Service 1959), pp. 71-79.

The basic hypothesis that self-concept of ability is a functionally limiting factor in school achievement emerges from the perceptual approach to individual behavior as expressed by Combs and Snygg, (4) and the symbolic interaction framework of social psychology derived from George H. Mead and others. (5) In this framework it is hypothesized that the child learns what he perceives he is able to learn. It is further hypothesized that his self-perception is acquired during interaction with significant others who hold expectations of the student as a learner.

The confirmation of this basic hypothesis will depend upon a demonstration that levels of learning in school subjects are modified by systematic changes in the self-concept of the learner through interaction with significant others. Such an experiment is anticipated as a second phase of the research program of which this report is for the preliminary stage.

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(3) *See Wilbur B. Brookover, "A Social Psychological* Conception of Classroom Learning," School and Society 87:84-87 February 28, 1959, and Wilbur B. Brookover and David Gottlieb, A Sociology of Education, Chapter 16, Revised Edition, (New York: American Book Co., now in press), for further elaboration of this basic theoretical position.

(4) Arthur W. Combs and Donald Snygg, Individual Behavior, Revised Edition. New York: Harper and Brothers, 1959.

(5) George H. Mead, Mind Self and Society, University of Chicago Press, 1934.

In this report we have identified the self-concepts which a sample of 7th grade students hold of themselves as learners and the relationships between various types of self-concepts of ability with current achievements in several school subjects. Anticipating the second phase of the study, we have also identified the other persons who are significant to the students in the realm of school achievement.

Although this aspect of the total research project provides an essential foundation, it does not demonstrate that changes in the images and expectations held by others will result in self-concept changes, or that the latter will produce changes in achievement. The crucial test of the theory and demonstration of its value in meeting the needs for talented personnel depends upon the possibility of changing students' self-concepts of ability and thereby their level of performance. We are therefore exploring the effects on the level of achievement of several methods designed to modify the self-concepts of ability held by three samples of low achieving students. These methods are: 1) modifying the images and expectations which existing significant others (in this case parents) hold of students' abilities, 2) by way of direct contact with the students introduce a significant other whose high images and expectations can be internalized by the students, 3) through counseling introduce a new significant other. (6)

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(6)This second phase of the project is being conducted by Wilbur B. Brookover, Jean LePere, Don E. Hamachek and Shailer Thomas at Michigan State University with the Support of the U. S. Office of Education, Cooperative Research Contract No. 1636.

Specific Hypotheses and Questions

Although adequate investigation of the general problem depends upon both phases of the research program, three hypotheses have been tested and several related questions have been explored in the portion of the study now completed. The hypotheses tested may be stated as follows:

(1) The self-concepts of high-achievers among junior high school students with similar levels of intelligence as measured by standard tests vary significantly from the self-concepts of low-achievers.

(2) Students' self-concepts of ability in specific school subjects vary both from one subject to the other as well as from their general self-concepts of ability.

(3) The expectations of significant others as perceived by junior high school students are positively correlated with the students' self-concepts as learners.

While our primary focus has been on testing the above hypotheses we have also raised several questions concerning the relevant variables in the study:

(1) How are seventh grade students' self-concepts of ability related to measured intelligence, sex, family socio-economic status?

(2) Who are the relevant significant others to whom seventh grade students relate themselves in examining their behavior as learners?

(3) Do the significant others of seventh grade students vary by sex, family background and achievement levels of the students?

(4) How are seventh grade students' self-concepts of ability related to other measures of the students perception of self and ability as a student?

(5) What is the relative effectiveness of several measures of self and student ability in predicting school grades?

The questions reflect the exploratory nature of this phase of the study. Although several persons have studied the relation of some measures of self to school achievement, no study has focussed on the particular aspect of self which we are seeking to identify - namely, self-concept of ability as a learner in school. In light of this we examined the usefulness of several instruments concerned with the perception of self and student abilities. These measures are described in Chapter 2.

In similar fashion we have investigated the variations in both the students' self-concept of ability and their identification of significant others by measured intelligence, sex, and family socio-economic status. An understanding of the possible variations in students' self-concept of ability and their interaction with their significant others is essential for the second phase of this research. This understanding is necessary before any systematic steps can be taken to raise school achievement through changes in self-concept.

Briefly, the hypotheses and questions to which we directed our attention in this study were designed to determine whether or not self-concept of ability was a significant factor in the achievement of junior high school students, as well as to provide a foundation for subsequent experiments designed to enhance the achievement of some students. The results of our investigation provide substantial support to the basic hypotheses and essential data for the pursuance of further research.

Related Research

Indicative of the growing interest in self-concept research are two studies recently undertaken: first, Arthur Combs, (Cooperative Research Project #814) is investigating the relationship of child perceptions to achievement and behavior in the early school years; second, Joseph Bledsoe, (Cooperative Research Project #1008) is examining the relationship of self-concepts of elementary school children to their academic achievement, intelligence, and manifest anxiety. Wylie's recent review of a number of studies concerned with self-concept and achievement is further evidence of the growing emphasis on this field. (7)

The development of the self or self-perception has a long history as an important area of psychology and social psychology. In recent years Combs and Snygg among others have emphasized its importance as a factor in determining the capacity to learn any type of behavior. (8) There is no known research specifically devoted to the identification of students' self-concept as a learner in relation to their achievement in specific school subjects. Several analyses of self in relation to other aspects of behavior provide valuable leads for our proposed study. Kuhn and his associates (9) at the University of Iowa have done several studies on the nature of self-images. Most relevant of these is an unpublished report by Waisenan (10) which examined the relation of self-evaluation as a student to levels of aspiration. The relationship varied with the status of the others to whom students referred themselves.

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(7) Wylie, Ruth C., The Self-Concept, Lincoln: University of Nebraska Press. 1961.

(8) Combs and Snygg, Op. cit., Passim.

Renzaglia (11) and Reeder (12) examined correlates of self-structure and found that a positive general self-concept is significantly related to high academic achievement. These investigators, however, used general personality traits to determine self-concept; they did not directly tap the students' conceptions of themselves as learners.

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(9)See, for example, American Sociological Society, Abstracts of Papers of the Fifty-third Annual Meeting (Washington, D.C.: The Society, 1958), pp. 97-100.

(10)See abstract of paper by Frederick B. Waisenan, "Social Determinants of Levels of Aspiration: Replication and Extension," Abstracts of Papers of the Fifty-Third Annual Meeting of the American Sociological Society (Washington, D.C. The Society, 1958), p. 99.

(11)G. A. Renzaglia, "Some Correlates of the Self Structure as Measured by an Index of Adjustment and Values," (Doctor's Thesis, University of Minnesota, 1952).

(12)Thelma Adams Reeder, "A Study of Some Relationships Between Level of Self-Concept, Academic Achievement and Classroom Adjustment," (Doctor's Thesis, Denton: North Texas State College, 1955).

Helper's (13) analysis of the self-concept within the framework of contemporary reinforcement theory is suggestive, but makes no direct contribution to relation of self-image to classroom learning.

There is some evidence to suggest that a student's performance in task orientated situations if influenced directly by his concept of self. For example, Roth, investigating the role of self-concept in achievement concluded, ". . . in terms of their conception of self, individuals have a definite investment to perform as they do. With all things being equal, those who do not achieve choose not to do so, while those who do achieve, choose to do so." (14) Further evidence is offered by Bodwin, (15) who found the correlations between immature self-concepts and reading disabilities to be .72 in the third grade and .62 in the sixth grade. Supporting evidence is reported by Coopersmith, (16) who found a correlation of . 36 between positive self-concept and school achievement in a group of 102 fifth- and sixth-grade children.

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(13) Malcolm M. Helper, "Learning Theory and the Self-Concept." Journal of Abnormal and Social Psychology LI: (September, 1955), pp. 184-194.

(14) R. M. Roth, "Role of Self-Concept in Achievement." Journal of Experimental Education, XXVII, (June 1959), 265-281.

(15) F. B. Bodwin, "The Relationship Between Immature Self-Concept and Certain Educational Disabilities", (Doctor's Thesis, Michigan State University, 1957).

An experiment reported by Videbeck (17) supports the proposition "that self-conceptions are learned and that the evaluative reactions of others play a significant part in the learning process." This study demonstrates significant changes in self-ratings in the hypothesized direction after one critique by an evaluator. In further support of our theoretical position is the evidence which suggests that people significant or important to another person can profoundly influence that person's concept of self. For example, Rosen, Levinger, and Lippitt (18) investigated the role of group-relevant determinants of desires for change (rather than desires for change emanating from personality determinants) and found a positive relationship between a person's desire for change and the wishes of others for him.

Another study relevant to our theoretical position is an investigation of Clarke, (19) who examined the relationships between college academic performance and expectancies. He found a positive relationship between a student's academic performance and his perception of the academic expectancies held for him by significant others.

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(16)S. Coopersmith, "A Method for Determining Types of Self-Esteem." Journal of Educational Research (1959) LIX, 87-94.

(17)Videbeck, Richard, "Self-Conception and the Reaction of Others," Sociometry, XXIII, (December 1960) pp. 351-359.

(18)S., Rosen, G., Levinger, and R. Lippitt, "Desired Change in self and Others as a Function of Resource Ownership." Human Relations, XIII, (1960), pp. 187-192.

(19)W. E., Clarke, "The Relationship Between College Academic Performance and Expectancies", (Doctor's Thesis, Michigan State University, 1960).

Further evidence that others can influence self-concept is provided by Staines, (20) who demonstrated that teachers, through their roles as significant others, can alter the self-concept of their students by making positive comments to them as well as creating an atmosphere of greater psychological security. These findings are related to those of Davidson and Lang (21) who found that children's perceptions of teachers' feelings toward them correlated positively and significantly with self-perception. They also discovered that the more positive the children's perceptions of their teachers' feelings, the higher their achievement.

Helper (22) found a small but consistently positive correlation between parental evaluations of their children and the children's self-evaluations, demonstrating again that self-appraisals reflect the appraisals of significant others.

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(20) J. W. Staines, "Self-Picture as a Factor in the Classroom." British Journal of Educational Psychology, XXVIII, (June 1956) pp. 97-111.

(21) H. H. Davidson, and G. Lang, "Children's Perceptions of Their Teachers' Feelings Toward Them Related to Self-Perception, School Achievement and Behavior." Journal of Experiment Education, XXIX, (1960), pp. 107-118.

(22) M. M. Helper, "Parental Evaluations of Children and Children's Self-Evaluations." Journal of Abnormal and Social Psychology, LVI, (1960), pp. 190-194.

The above studies share the common idea that one's self-concept can affect his performance and behavior, Furthermore, they present evidence to suggest that changes in levels of performance or in behavior are commensurate with changes in self-concept. Other evidence seems to imply that people significant or important to another person can profoundly influence that person's concept of self. None of the previous studies have focussed on the identification of the self as it concerns perception of ability to learn. There is, however, general support for the proposition that self-concept is related to performance and to the expectations of others.

Chapter II

The Research Methodology

In order to explore the nature of seventh grade students' concepts of their ability and to develop an instrument to measure this, we interviewed a sample of forty-nine high- and low-achieving students, who were in the seventh grade one year prior to those who participated in the final study. The pre-test sample responded to a series of multiple choice questions concerning their own ability as students. (1) The self-concept of ability scale, described below, was structured on the basis of the pre-test sample responses.

Other means of measuring self-concept as well as methods of obtaining additional necessary data were also explored in the pre-test interviews. Several decisions concerning the research methodology were based on the pre-test data. The most important of these was to obtain data from many students in a mass administration of the self-concept scale and other tests rather than depend entirely on a smaller number of interviews. In the absence of a tested instrument the original design called for the use of interviews to obtain self-concept of ability data. Success in developing a self-concept scale that could be administered in a group-setting, and the cooperation of the administration of the "Oldtown" school system made it possible to obtain this data from all available 1960-61 seventh grade students. These data pertaining to school achievement and intelligence test scores were also available for all students. The analysis relevant to Hypotheses I and II discussed earlier (2) concerning the nature of the self-concept of ability and its relation to school grades is therefore based on data collected from approximately 1,050 seventh grade students in the four public junior high schools in the "Oldtown" system.

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(1)The pre-test schedule and procedure is described in Appendix A.

The data concerning significant others and the students' perception of their expectations were obtained in 112 interviews with over- and under-achieving students. The analysis relevant to the third hypothesis and to related data involving significant others is based on interviews with this smaller group.

The Self-Concept of Ability Scales

A search of literature on self and self-concept revealed no previously developed instrument designed to measure self-concept of academic ability. Several instruments have been developed to measure many aspects of self-concept and self ideal, but these gave little attention to the particular segment of self with which we are concerned -- concept of academic ability.

A set of sixteen multiple choice questions devised by the research staff and consultants were administered to 49 seventh-grade students in the pre-test group. These sixteen items, judged to be relevant to one's conception of one's ability to do well in school, were presented to the students in an interview held in private interviewing rooms on the university campus. The self-concept questions were presented as part of a paper-pencil test to which each student responded during the interview. Scalogram analysis of the pretest responses to the sixteen questions produced an eight question Guttman type scale with reproducibility of .91.

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(2)See pp. 5-6.

(3)Ibid.

From this pretest experience, it was concluded that a paper-pencil self-concept of ability scale was feasible. Original plans to interview only a limited sample of high- and low-achievers were discarded and the self-concept of ability scale was administered to all seventh grade students in "Oldtown" public schools during the fall of 1960.

A second scalogram analysis was made of the 1,050 seventh grade students' responses to the eight items. Coefficients of reproducibility -- .95 for males and .96 for females -- were somewhat higher than for the pretest group. The eight questions are presented below in the scale order from the self-concept of ability scale. They were presented to the students in the order shown in the questionnaire, Appendix B, rather than in the scale order shown below.

The test was scored two ways: Guttman scale type score was determined for each individual and a conventional total score for the eight items. The latter was the sum of the values 1 to 5 assigned to the responses for each item. Correlations between self-concept and the criterion grade point average was calculated for each scoring method. Since there was little disparity between

SELF-CONCEPT OF ABILITY--GENERAL ©

1. Where do you think you would rank in your class in high school?

    ____ a.(4) among the best
    b. above average
    c. average
    d. below average
    e. among the poorest

2. In order to become a doctor, lawyer, or university professor, work beyond four years of college is necessary. How likely do you think it is that you could complete such advanced work?

    ____ a. very likely
    b. somewhat likely
    c. not sure either way
    d. unlikely
    e. most unlikely

3. Do you think you have the ability to complete college?

    ____ a. yes, definitely
    b. yes, probably
    c. not sure either way
    d. probably not
    e. no

4. How do you rate yourself in school ability compared with those in your class at school?

    a. I am among the best
    ____ b. I am above average
    c. I am average
    d. I am below average
    e. I am among the poorest

---

(4)The line below this response and in each of the subsequent scale items indicates the division of responses used in the scalogram analysis.

5. Forget for a moment how others grade your work. In your own opinion how good do you think your work is?
    - a. my work is excellent
    - ______ b. my work is good
    - c. my work is average
    - d. my work is below average
    - e. my work is much below average

6. What kind of grades do you think you are capable of getting?
    - a. mostly A's
    - ______ b. mostly B's
    - c. mostly C's
    - d. mostly D's
    - e. mostly E's

7. Where do you think you would rank in your class in college?
    - a. among the best
    - b. above average
    - ______ c. average
    - d. below average
    - e. among the poorest

8. How do you rate yourself in school ability compared with your close friends?
    - a. I am the best
    - b. I am above average
    - ______ c. I am average
    - d. I am below average
    - e. I am the poorest

these correlations, total self-concept of ability scores, rather than scale type scores were used in the analysis. The distribution of total self-concept scores was approximately normal.

The reliability of the self-concept of ability scales determined by Hoyts' method was .82 for males and .77 for females. A cross-validation of the general self-concept scales prediction of grade point average was made on a random sample of students in the schools studied, but not included in the basic analysis. Predicted GPA correlated with actual GPA .70 for females and .71 for males. These reliability and cross-validation analyses are reported more fully in Appendix C.

Self-concept of ability scales for four school subjects were constructed from the eight items in the General Self-Concept of Ability Scale. The basic school subjects, English, Science, Mathematics and Social Studies, were the foci of these specific self-concept scales. The four scales are combined in one instrument as shown in Appendix B.

The Students Studied

Although we have some data on practically the total universe of "Oldtown" public school seventh graders in 1960-61, some were not included in the study. Eliminations were made for two reasons: racial identification and incomplete or inadequate data.

About 100 Negro students were not included in the present analysis because our preliminary observation indicated that differences on several variables were such that they should be investigated independently. A separate study is planned and comparative data will be available at a later date.

Inadequate school grade records and intelligence test data were the major factors in eliminating students for whom we have other data. Since the IQ was an independent variable in the study, and also because of its known variability, we omitted all students who did not have at least two sets of IQ scores. Inasmuch as the California Test of Mental Maturity is regularly given in the school system at Grades 2, 4, and 6, all students for whom two sets of IQ scores were on file were included in the sample studied if other data were available. To insure sufficient data for determining achievement, at least two years of grades between the 4th and 6th grades were required, thus at least eight different evaluations of school performance were available. Some students for whom complete school record data were available were not present or did not complete the questionnaire when it was administered to the seventh grade groups. This reduced the number of students for whom we had complete school record and questionnaire data to approximately 55 per cent of the 1930 seventh-grade students enrolled in the four "Oldtown" junior high schools during the fall of 1960. Over 50 per cent of the seventh-grade students in each school were included in the sample on which our analysis is based.

Comparability of Data Across Schools: The California Test of Mental Maturity scores are relatively comparable across the four schools. The tests are administered at approximately the same time in each school, and scored in the school system's central office. The subject evaluations are probably more variable. Although the report cards are the same throughout the whole school system, teacher variation cannot be controlled.

The content areas are the same, but some teachers may grade more on effort relative to ability, and others on a strict curve. Ability grading was not practiced in the elementary schools, but variability in grading may result from the composition of the school population. If either end of the ability range is missing, teachers are not apt to adjust their grading to fit this fact, and so higher grades may be assigned when the ability distribution is positively skewed, and lower grades in the reverse case. Approximately thirty elementary schools comprise the school system and some variation in these student populations may be assumed. By the time students reach junior high school, however, many of the school differences have cancelled out.

Most of those students eliminated because of incomplete data were new to the "Oldtown" school system. Lower class migration may be greater than that of the higher social classes. If so, the students included in the study are not representative of the total in the system. The inclusion of students who had attended several different elementary schools in the system minimizes the effect of possible differential migration on the sample, however.

The distribution of IQ scores in this school system does not differ from the national norms. In this dimension, then, the community can be considered typical of the nation as a whole.

Socio-Economic Status of Students Studied: The SES index devised for this study is based on school record data. At the time the parents enrolled a child in the system the educational level and current occupation of each parent was obtained. Some attempt was made to keep the occupational data up to date, but this was not done uniformly. Also, the occupational information very often consisted of only the place of work without specifically describing the nature of the work done. The educational information was more complete and therefore was more heavily weighed as a factor in the index. The categories for both variables are shown in Appendix D. We used only a rough classification of three social class levels in the social status analysis. Categories were devised for those individuals who fell at each end of the social class span and the remainder constituted the middle SES level. The upper SES level consisted of families where one of the following criteria was met: The father had at least some college, the mother was a college graduate, or the father's occupation was professional or business. The lower SES level consisted of families where the following criteria were met: The father had 10 or fewer years of education or the father's occupation was a semi-, unskilled, or service one with a code 5 or 4. The remaining people (and the three cases where no educational or occupational data were available) fell in the middle category. In general the middle group consisted of skilled labor, clerical, and sales personnel who had a high school education. In the few cases where the father was missing from the home, the mother's occupation and education determined the family status.

It will be noted that the mother's status was specifically examined only when the upper SES level was being designated. As the focus of the research involved educational attitudes and values, and since the mother is a primary socializing agent in the family, it was felt that if she had graduated from college

the values of the household would have been influenced accordingly. Studies of over-achievement have also indicated that the mother is particularly influential in encouraging educational values which are consonant with achievement.

The Schools Attended: Since the four "Oldtown" junior high schools draw from different ecological areas, socio-economic status (SES), IQ, and GPA were analyzed to determine variations among them. Each of the variables was trichotomized, and chi square was calculated for each of the three by four tables. If the chi square value was significant, the cells contributing heavily to the chi square value were run alone against all other cases in 2 by 2 tables. The significant differences reported below represent individual cells noticeably different from the rest of the population. Data were processed separately for males and females. Most of the differences occur among the males.

A brief description of each school follows:

School A, is the smallest and newest junior high school in the system. It is located near the city limits. There has been considerable shifting in population as outlying districts sent students in and later withdrew them as other facilities became available. The school also includes students from a section of town inhabited by families who have recently migrated to the area. Many of these students were automatically eliminated from our sample as they had not been in the school system long enough to have cumulative records. No systematic attempt was made to omit them. As a result many are in the sample. School A deviates from the mean of all schools in this survey in that it has significantly more lower-class seventh-grade boys. This social class difference, however, is not reflected in IQ scores. The school atmosphere is permissive, but there is an absence of wide-spread school loyalty.

School B draws from a relatively stable attendance area. A considerable range of the census tract areas is represented in the school, but neither the very wealthy nor the very poor areas are included. Among the males there are significantly more low and fewer high IQ students, as compared to the city as a whole, but this is not true for the girls. Also there are significantly more males with low GPA than expected. The social-class distribution is not skewed in a similar fashion however. An impressionistic view of the School B's atmosphere is one where discipline is enforced. Students comment on the strictness. On the other hand, there seems to be considerable school pride and many actively-supported school-wide activities.

School C furnishes the largest sample of students with complete data as described above. It draws from a relatively stable population. A study of the census tracts supplying the student population shows the very high and the very low socio-economic areas are represented at the school. The distribution within the range is typical of the sample as a whole except that no minority groups are conspicuously present. An impressionistic view of the school atmosphere reveals considerable school pride. The identification with many all-school activities seems pronounced. The discipline seems less restrictive than in School B.

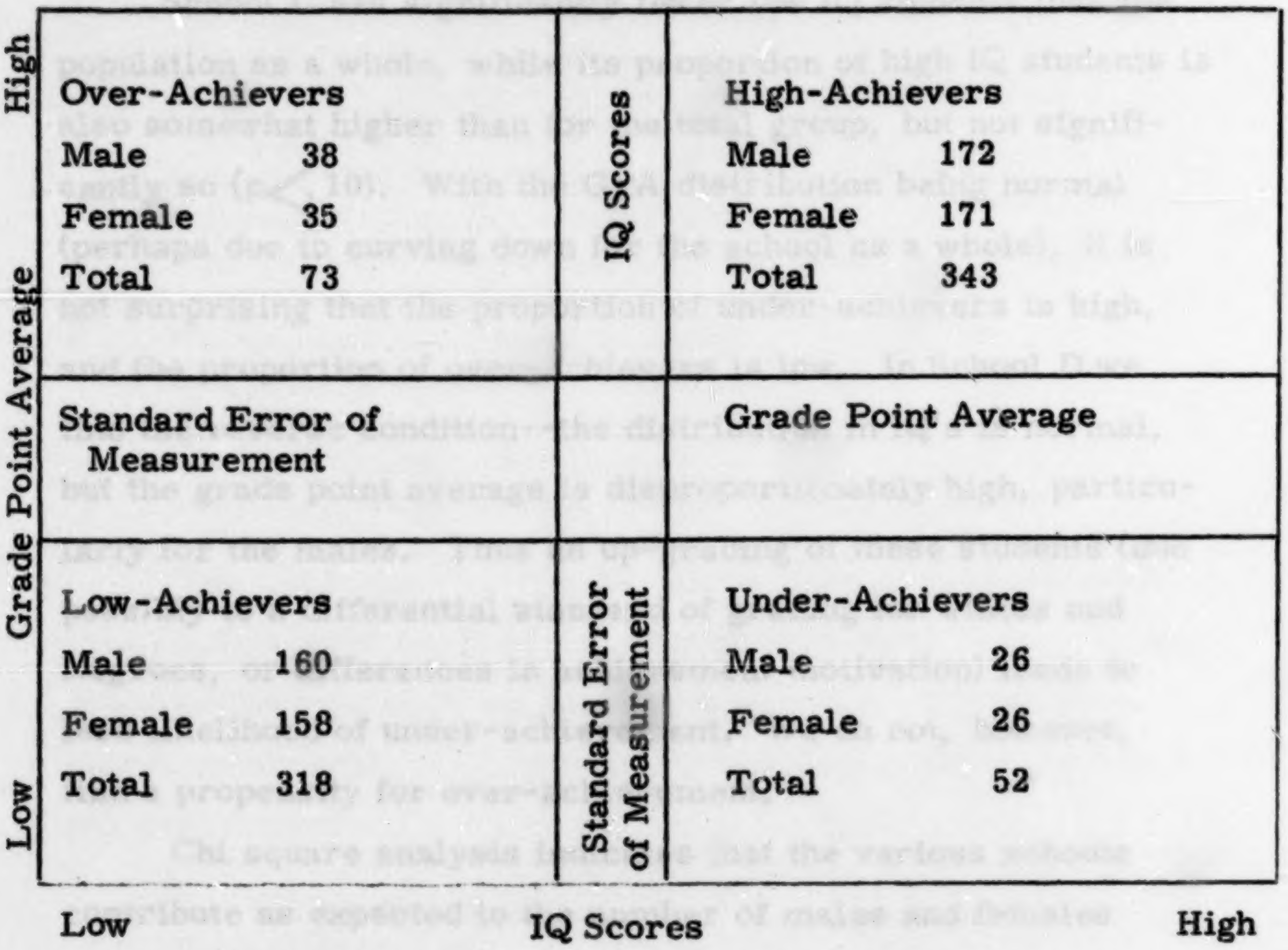
School D is undoubtedly the most heterogeneous one in the city. The majority of the Negroes attend this institution. The highest and lowest socio-economic levels of the city are represented. In addition students from a sizable new housing area are being transported to this building. This school supplies the smallest proportion of students with complete available data, because many of them come from new areas where data were not comparable. In addition, the large Negro population was eliminated from this study. Significantly more boys and girls with high-social-class backgrounds than expected, and fewer boys with low-social-class backgrounds than expected were included. This is reflected in considerably higher grades among the boys. The IQ distribution does not differ from the sample as a whole. One might suspect that the students chosen are either up-graded in a racially different grading system or there is a racial difference in achievement motivation. The school atmosphere is characterized by strict discipline. A student body divided by race seems to prevent unity except on the athletic field where the school is frequently victorious.

The Over- and Under-Achievers: The "over" and "under" achiever groups are important to our analysis. They were selected in the following manner: all students who fell within one standard error of measurement on either side of the mean of two total scores on the California Test of Mental Maturity were eliminated. The means were 107 and 108 for the males and females respectively. The standard error of measurement was computed on the basis of the reliability of .90 reported in the manual. Similarly, the standard error of measurement was computed for grade point average using Hoyt's analysis of variance for four subjects over three years for a random sample of students as an estimate of reliability. The reliability coefficient was calculated to be .95; the mean GPA for the males was 2.47, and for the females 2.80. Students within a standard error of measurement around the mean on GPA also were eliminated. The remaining students, indicated in the four cells of Figure 1, could reasonably be identified as four different groups on these two criteria.

Whether the different schools contribute disproportionately to the numbers of over- and under-achievers is an appropriate question. One would expect that over- and under-achievement would be related to the demographic features of the population

Figure 1

Classification of Students on the Basis of Measured Intelligence and Grade Point Average for Identification of Achievement Categories


High
Grade Point Average
Low
Over-Achievers
Male 38
Female 35
Total 73
IQ Scores
High-Achievers
Male 172
Female 171
Total 343
Standard Error of Measurement
Grade Point Average
Low-Achievers
Male 160
Female 158
Total 318
Standard Error of Measurement
Under-Achievers
Male 26
Female 26
Total 52
Low
IQ Scores
High

as well as to school climate. Chi square analysis shows no differences in the distribution of over-achievers, although School C comes close ($p < .10$) to having significantly fewer over-achievers than expected. The distribution of under-achievers shows significant differences, with two schools differentiated at the .05 level. School C has significantly more under-achievers than expected; School D has significantly fewer.

School C has significantly fewer low IQ students than the population as a whole, while its proportion of high IQ students is also somewhat higher than for the total group, but not significantly so ($p < .10$). With the GPA distribution being normal (perhaps due to curving down for the school as a whole), it is not surprising that the proportion of under-achievers is high, and the proportion of over-achievers is low. In School D we find the reverse condition--the distribution in IQ's is normal, but the grade point average is disproportionately high, particularly for the males. Thus an up-grading of these students (due possibly to a differential standard of grading for whites and Negroes, or differences in achievement motivation) leads to less likelihood of under-achievement. We do not, however, find a propensity for over-achievement.

Chi square analysis indicates that the various schools contribute as expected to the number of males and females who fall in the over- and under-achievement categories.

The reading scores for the under-achievers were checked, and none with more than one standard deviation below the mean for the group as a whole were found.

The Data Obtained

Our analysis is based on data from three sources: school records, a questionnaire administered to all Oldtown seventh-grade students present at the time, and interviews with the identified over- and under-achievers previously described.

School Record Data: The following data were obtained from cumulative student records in the school offices.

4th year California Test of Mental Maturity verbal and nonverbal scores
6th year California Test of Mental Maturity verbal and nonverbal scores
4th year California Reading Test
6th year California Reading Test
4th, 5th, 6th, 7th year grades in: Arithmetic, English, Social Studies, and Science
Educational attainment of father
Educational attainment of mother
Current occupation of father
Current occupation of mother
Schools attended during the 4th through 6th years

The Questionnaire: In the fall of 1960, a questionnaire was administered to all of the students who were in the seventh grade in the four Oldtown junior high schools. The questionnaire, as presented in Appendix B, was composed of the following subsections:

Ten Statements Test
Student Role Test
General Self-Concept of Ability
General Importance of Grades
Specific Subject Self-Concept of Ability
Specific Subject Importance of Grades
Rank of Liking of Subjects
Rank Order of Importance of Grades in Subject

Model for Self Question
Occupational Aspiration and Expectation
Educational Aspiration and Expectation

A brief explanation of each section in the order presented in the questionnaire follows:

Ten Statements Test. The Ten Statements Test is a modification of the Twenty Statements Test developed at the State University of Iowa by Manfred Kuhn and Thomas McPartland. (5) The test asks for ten responses to the question "Who Am I?" After completion of these statements the students were asked to circle the most important of their responses. No number to be circled was specified. The TST was included in the questionnaire to determine the place of the students' academic self-concept in his more holistic self-definition. The total number of academic self-definitions made by the student in the list of ten statements was recorded as one score on this test. A second score was obtained from the number of academic self-definitions identified by the student as most important.

Student Role Test. The Student Role Test asks the student to give ten responses to the question, "What Does A Student Do?" This test, developed by Fred Waisanen at Michigan State University, (6) is scored by assigning +1 to statements consistent with the culturally approved student role; -1 to statements of culturally disapproved aspects of the student role; and 0 to statements irrelevant to the student role such as "a student breathes." The students were further requested to circle those statements describing what they personally do as students. Two scores were obtained: one based on all items written and the other based only on the items describing their own actions. The SRT was included in the test battery to determine if self-concept of ability was related to the definition of the role involved in being a "student."

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(5) Manfred Kuhn and Thomas McPartland, "An Empirical Investigation of Self Attitudes," American Sociological Review, 19 (February 1954), pp. 68-76.

(6) Fred Waisanen, "Some Correlates of the Student Role Test," paper read at the Ohio Valley Sociological Meeting, May 4, 1962, East Lansing, Michigan

General Self-Concept of Ability. This test consists of eight five-choice items developed from a pretest analysis as explained earlier in this chapter. The items were coded from 5 to 1 with the higher self-concept alternatives receiving higher values.

General Importance of Grades. This test consists of seven four-choice items which formed a Guttman scale of acceptable reproducibility (.91) in the pretest responses. The items were coded from 4 to 1 with the alternatives indicating greater importance of grades assigned the higher values. A total score of the seven items was used in the analyses. The IG scale was included to determine if self-concept of ability was independent of a student's attitude toward the importance of achievement. Subsequent investigation of the IG scale has indicated that the items are not undimensional, but are composed of two dimensions, only moderately correlated. The two dimensions have been designated as an absolute importance of grades (AIG) and competitive importance of grades (CIG). As the titles suggest, AIG is concerned with the importance of doing well--in an absolute sense, while CIG is concerned with the importance of doing better than others in a competitive situation.

Specific Subject Self-Concept of Ability. The items for these scales are directly parallel to the general self-concept of ability items only this time dealing with specific subjects. The specific subjects are arithmetic, English, social studies, and science, the core academic courses offered in the junior high school program. The student is asked to respond separately by subject thus giving four 8-item tests which are scored like the general self-concept test. These items were used in testing Hypothesis II dealing with specific self-concepts of ability.

Specific Subject Importance of Grades. These items are analogous to the General Importance of Grades items except that they have a specific subject reference and there is one less item in the specific subject questions. Again the students are directed to respond separately for the four subjects. The four resulting tests are scored similarly to the general importance of grades test.

Rank Ordering of Liking of Subjects. Students were asked to rank the four subjects (arithmetic, English, social studies and science) in the order of personal preference. The ranking was coded 4 to 1 with the best-liked subject receiving a code of 4. The rating was included to permit examination of whether self-concept of ability and/or achievement was influenced by the extent to which one liked or disliked a subject.

Rank Ordering of Importance of Grades in Subjects. Students were asked to rank the four subjects in the order in which the grade they received was important to them. The ranking was coded from 4 to 1 with the most important subject grade receiving the highest value. This ranking permitted examination of whether self-concept of ability and/or achievement were related to the importance of achieving in a particular subject.

Model for Self. A single question asked the student to indicate whom he would like to be if he could be anyone in the world. Based on the responses given, a code was devised which distinguished answers referring to self, parents or relatives, peers, famous persons in entertainment and sports, well-known people in public service, adults (other than parents and relatives) known to the student, and those unclassifiable.

Occupational Aspirations and Expectations. The students were asked in open-ended questions to indicate the job they would most like to have when they grow up as well as the job that they think they probably will have when they grow up. Self-attitudes toward achievement and achievement itself were expected to be related to the occupational aspirations and expectations of the students--at least for the boys. The data were coded by a crude occupational rating scale and the discrepancy between aspiration and expectations was noted.

Educational Aspirations and Expectations. The students were asked to indicate how far they would ideally like to go in school and how far they expected they would really go. These data were treated similarly to the occupational data above.

The Interview

To test Hypothesis III concerning the relation of self-concept to the perceived images held by others, to investigate more fully other factors which might be related to different achievement levels, and to identify the significant others which were hypothesized to be of importance in the formation of the students' self-concept, an interview schedule was utilized. One hundred twelve over- and under-achieving students identified earlier were interviewed. It should be emphasized that aside from Hypothesis III no specific hypotheses were formulated, nor was any systematic theory utilized in developing the interview material. Except for questions designed to identify significant others, the interview was used to explore several areas which might be relevant to self-concept and achievement. Among these were attitude toward school, peer group relations, and relevant interactions with significant others. Open-ended questions were used in the interview.

The interviews were arranged contacting the parents by telephone. Almost all parents were cooperative. Of the 116 children whose parents were contacted we were unable to interview only four--three females and one male. Although there was no face to face interaction, the parents were quite willing to allow the child to be interviewed under the conditions outlined by the staff person.

All students were interviewed in private rooms at the university to control extraneous or distracting influences which would have been present if the interview had been conducted at home or school. This provided "neutral ground" unknown to the interviewees. Moreover the physical setting was controlled. It was felt that these facilities enhanced the atmosphere of a confidential interview and insured more responsiveness on the part of the students.

Trained personnel conducted interviews. Each interviewer had observed at least one interview conducted by an experienced interviewer. In addition he completed a trial interview with a student not included in the sample studied (high and low-achievers), before they undertook a regular one with the over- or under-achievers. The research staff observed and later criticized these trial experiences. In addition, periodic checks were made on the interviewers.

Because of the exploratory nature of the study the interviewers were encouraged to probe further than the schedule directed in areas that seemed productive. The one-hour and thirty-minute interview consisted of two open-end questions which the students filled out themselves, as well an open-ended interview schedule. The topics covered in the interview are as follows:

Filled out by the student:

Identification of general significant others
Identification of academic significant others

Topics on which the subject was interviewed:

Family background

Significant others mentioned in above identification
Peer group memberships
Daily schedule and activities
General orientation to school, school work and teachers
Priority of academic role
Perceived images of significant others--ability of interviewee
Perceived images of significant others--attitude toward achievement.

CHAPTER III

Results of Investigation

The results of our investigation relevant to the primary hypothesis and questions identified in Chapter One are presented in this chapter. Since our primary focus is on the self-concept of ability, we first examine its relation to sex, social class, and school attended to determine if these variables should be controlled in subsequent analysis. Tests of the major hypothesis and other relevant questions follow. Unless otherwise indicated the analyses are based on data from 1,050 seventh-grade students in four Oldtown junior high schools.

Self-Concept of Ability by Social Class, Sex, and School

The mean self-concept scores for the 513 males and the 537 females are presented by sex and by family socio-economic status in Table I. Comparable data by junior high school attended are shown in Table II. The mean self-concept of ability score for all girls is significantly higher than that of the boys. Since, as will be noted later, self-concept of ability is differentially related to achievement and other variables among boys and girls, sex is controlled in the analysis whenever feasible.

Each of the higher social class groups has a significantly higher mean self-concept of ability score than the next lower social class group among both boys and girls. Although this demonstrates some difference among socio-economic groups, this factor did not materially affect the relations of self-concept to other variables. For example, the correlations of self-concept

Table I

Mean Self-Concept of Ability Scores by Sex and Social Class Identification

Social Class	Males Mean S-C	Number	Females Mean S-C	Number
Higher	28.73	143	29.87	149
Middle	27.45	232	28.19	256
Lower	25.88	138	26.97	132
Total	27.35	513	28.25	537

Table II

Mean Self-Concept of Ability Scores by Sex and Schools in Sample

Junior High School	Males Mean S-C	Number	Females Mean S-C	Number
A	26.60	95	28.32	113
B	26.80	133	28.64	138
C	28.19	161	28.21	162
D	27.46	124	27.87	124
Total	27.35	513	28.25	537

with school grades is reduced only slightly (.57 to .54 for males and .57 to .53 for females) when socio-economic status is partialled out. Social-class adds very little to self-concept in the prediction of Grade Point Average in a multiple correlation. Since our social-class index affected the conclusion regarding the relation of self-concept to school achievement so little, we have not controlled for this factor in all our subsequent analyses. The distribution of measured intelligence and Grade Point Average as well as correlation data showing the effect of social-class are found in Appendix E.

The mean self-concept score of male students in school C is significantly higher than that of the males in schools A and B at the .05 probability level. There are no differences between the girls' self-concept by schools. Differences in the school academic climates may affect self-concepts of ability, but since there are no differences common to males and females such conclusions are not justified from these data. In view of these results we have pooled the data from the four schools in our subsequent analyses.

Tests of Hypothesis I

The first major hypothesis stated that self-concept of ability to achieve is related to achievement when intelligence, as measured by standard IQ tests, is controlled. Two types of analyses were made to test this hypothesis. The mean self-concept scores of students in the same IQ category but with different achievement levels were compared. In other words, the mean self-concepts of over-achieving and low-achieving students -- who had IQ's a standard error of measurement or more below the mean for the total group -- were tested for significance of difference. In the same manner difference between under-achievers and high-achievers was tested. These achievement categories are defined in Chapter 2. The results of the "t" test shown in Table III clearly indicate that high-achieving students have significantly higher self-concept of ability scores than low achieving students with comparable measured intelligence ranges.

Table III

Mean Self-Concept of Ability Score by Sex and Achievement Group with Probability of Difference Between Groups

Measured Intelligence		Mean Self-Concept Scores High GPA*	Mean Self-Concept Scores Low GPA*	Probability of Difference
High*	Male	29.94	26.17	.001
	Female	30.74	27.27	.001
Low*	Male	27.67	24.58	.001
	Female	29.58	25.70	.001

* Those students with measured IQ ± one standard error of measurement around the mean and those with GPA ± one S. E. M. around the mean are excluded from this analysis to assure that high and low categories in each case are different.

The mean IQ scores of the high-achievers -- boys 125, girls 123 -- was somewhat higher than that of the under-achievers -- boys 115, girls 115 -- and the mean IQ scores of the low-achievers -- boys 91, girls 94 -- were lower than those of over-achievers -- boys 96, girls 99. The significant difference in self-concept scores could be affected by this IQ difference. A sample of high-achievers was matched with a sample of under-achievers on sex, IQ, and social class to determine if such factors affected the self-concept differences. Similar samples of over-achievers and low-achievers were selected. The differences in mean in self-concepts of ability were in the same direction and significant at the .01 level of significance or beyond. Thus the major hypothesis is confirmed under these more stringent controls.

The hypothesis that self-concept of ability was significantly related to school achievement with measured intelligence controlled was also tested by correlation analysis of the total population on which data was obtained. Correlation between 7th GPA and general self-concept scores was obtained with the effect of IQ partialled out for both the boys and girls. The relevant coefficents of correlation are shown in Table IV with and without the effect of the third variable partialled. Even when the effect of the third variable is controlled all of the correlations are significant and positive. Of particular interest, of course, is the significant correlation -- males .42 and females .39 -- between self-concept and achievement when IQ is partialled out. This concurs with the previous "t" test analysis in support of the first hypothesis.

The very low correlation -- .17 -- between self-concept and IQ when achievement is partialled out demonstrates that the self-concept of ability scale measures quite a different variable than the IQ test measured.

Table IV

Correlations Between Seventh-Grade Grade Point Average, Measured Intelligence, and Self-Concept of Ability for Males and Females. *

Correlation Coefficients

Variables	No Variable Controlled		Third Variable Controlled		
Correlated	Males N=513	Females N-537	Variable Controlled	Male N=513	Female N=537
7th GPA - IQ	.61	.65	S-C	.48	.53
7th GPA - S-C	.57	.57	I.Q.	.42	.39
Self-Concept-IQ	.46	.48	GPA	.17	.17

*The Multiple Correlation (R 1.23) among GPA, I.Q., and Self-Concept is .69 for males and .72 for females.

Comparison of the IQ-GPA partial correlation (with the effect of self-concept partialled out) with the multiple correlation of IQ and self-concept with GPA, indicates that the correlation increases from .48 to .69 for the males, and from .53 to .72 for the females. Such increases approximately double the variance accounted for by adding the self-concept variable. The multiple correlations reported have beta weights of .44 for IQ and .37 for self-concept among the males and .49 for IQ and .34 for self-concept among the females. Thus IQ is weighted slightly higher

concept among the females. Thus IQ is weighted slightly higher

than self-concept of ability for both males and females.

The correlation between specific self-concept of ability in school subjects and grades in each subject are shown in Table V. They are of essentially the same magnitude and give further support to the hypothesis.

Table V

Correlation Between General Self-Concept of Ability and Self-Concept of Ability in Specific Subjects with Total and Subject Grade Point Averages for Seventh-Grade Males and Females.

Variables Correlated	Correlation Coefficients			
	Without I.Q. Controlled		With I.Q. Controlled	
	Males N=513	Females N=537	Males N=513	Females N=537
General S-C & Total GPA	.57	.57	.42	.39
Math. S-C and Math. Grade	.59	.54	.47	.39
English S-C and English Grade	.43	.47	.31	.34
Soc. St. S-C and Soc. St. Grade	.56	.58	.46	.44
Science S-C and Science Grade	.61	.51	.49	.38

The interaction of the GPA--IQ--Self-concept variables among the over-and under-achiever is relevant here. It should be remembered that the criteria for selecting the over- and under-achiever categories were such that a negative correlation between grade-point average and IQ was insured. Of concern here is the interaction of these variables with self-concept measures. The males and females and the over- and under-achievers are com-

males and females and the over- and under-achievers are com-

bined in this analysis. The results shown in Table VI indicate a significant correlation between grade-point average and self-concept of ability in this segment of the total sample.

All analyses of data relevant to the first major hypothesis that self-concept of ability is related to school achievement when

Table VI

Correlations Between Seventh-grade Grade Point Average, Measured Intelligence, and Self-Concept of Ability for 110 over- and under-achieving students* (males and females combined).

Variables Correlated	Coefficients of Correlation No Variable Controlled	 One Variable Controlled	 Variable Controlled
7th Grade Point Average and IQ	-.23	-.15	S-C
7th Grade Point Average and Self-Concept	.40	.36	IQ
Self-Concept and IQ	-.25	-.18	GPA

*The Multiple Correlation (R 1.23) among GPA, IQ and S-C is .42

measured intelligence is controlled consistantly support the hypothesis. Therefore it seems clear that self-concept of ability is a significant factor affecting the school achievement in this seventh-grade population.

Test of Hypothesis II

The second major hypothesis of the study stated that students' self-concepts of their ability to achieve in specific school subjects vary from one subject to the other and from their general self-concept of ability. The correlations between general and specific self-concepts of ability, shown in Table VII, are comparable for the males and females except in science where the females have a significantly lower correlation. While the

Table VII

Correlations between General Self-Concept of Ability and Specific Self-Concepts of Ability in Four Subjects for Males and Females

	Males (N = 513) r	Females (N = 537) r
General SC and SC-Mathematics	.65	.64
General SC and SC-English	.63	.61
General SC and SC-Social Studies	.64	.62
General SC and SC-Science	.66	.54

correlations are expectedly high, they are significantly lower than the reliability coefficients for the self-concept measure. (See Appendix C for reliability of major variables and cross-validation analysis.) It can thus be concluded that they are measuring somewhat different variables than the general self-concept scale measures.

No differences in the self-concept of ability scores in the various subjects were postulated for the group as a whole; the differences were postulated to exist for individuals. However, there were some significant differences between mean general self-concept scores and the mean specific self-concept scores in some subjects, for both boys and girls. These differences are shown in Table VIII. The mean GPA for four subjects and for all subjects are also shown for comparison.

Table VIII

Mean Self-Concept of Ability Scores and Mean Grade Point Average in all Subjects and for Each of Four School Subjects; (the higher the self-concept score the more positive the self-concept. Range possible, 8-40.)

	Males (N = 513)		Females (N = 537)	
	Mean Self-Concept	Mean GPA	Mean Self-Concept	Mean GPA
All Subjects	27.35#	2.07	28.23#	2.43
Mathematics	26.97	2.10	27.47*	2.36*
English	25.45*	2.00*	28.17	2.61*
Social Studies	25.63*	1.99*	26.58*	2.29*
Science	27.18	2.21*	27.73	2.49*

#Mean general self-concept of ability score not mean of specific subject self-concept of ability scores.

*Significantly different ($p \leq .05$) from the mean score for all subjects using a two-tailed "t" test for correlated data.

The mean self-concept scores in the four subjects are in approximately the same rank order as the average achievement in the subject. This is true for both males and females. The average achievement and self-concept scores for females exceed that of the males in all subjects. It is particularly noteworthy that the mean general self-concept of ability scores for both sexes are higher than any of the specific self-concept scores. Apparently a student's general self-concept coincides more nearly with areas of success than with areas of failure.

To test the hypothesis that students' self-concepts of ability in specific subject areas are functionally distinct from their general self-concepts of ability, the correlations between general self-concept and specific subject achievement were compared with the correlations between specific self-concepts and specific subject achievement. If the specific self-concept is functionally different from the general, the specific subject self-concept correlations with specific subject achievement should be significantly higher than the general self-concept correlation. The comparative correlations are reported in Table IX.

Except in English the correlation between specific subject self-concept and subject achievement are higher than the correlation between general self-concept and achievement in specific subjects. Three of the six correlations were significantly higher as determined by the two-tail "t" test appropriate for testing in correlated means. In one additional case (the one-tailed "t" test) indicated a significantly higher correlation. Three of these four increases were for the males.

The local curriculum may differentially affect the relation of self-concept to specific subjects, but more widespread cultural factors may also be involved. The more significant differences are found in mathematics and science among boys. These subjects are culturally defined as more important for male achievement. But English is commonly culturally defined as more appropriate for females and differences are not found in this area. The career orientation of males may be the distinguishing factor. Males may see subjects as a means leading more directly to a job, and so each subject may become more specificly relevant to

Table IX

Correlation Among General Self-Concept of Ability, Self-Concept of Ability in Specific Subjects, and Seventh-grade Grades in Four Subjects for 513 Males and 537 Females

Variables Correlated	Correlation Coefficients							
	Math		English		Soc. St.		Science	
	M	F	M	F	M	F	M	F
General S-C and Grade	.50	.52	.44	.52	.51	.50	.52	.48
Specific S-C and Grade	.59**	.54	.43	.47	.56*	.58**	.61**	.51
General S-C, Specific S-C, and Grade	.60	.59	.48	.55	.60	.61	.63	.57

**Significantly greater than correlation between general S-C and grade on two-tailed "t" test.

*Significantly greater than correlation between general S-C and grade on one-tailed "t" test.

career success. Females, on the other hand, may be much more likely to view achievement as an end in itself, and not as a means to an end. The finding in social studies may be explained by the fact that this is the subject in which the girls have the poorest achievement, perhaps the differentiation is nothing more than a concern about their relatively poor performance. It has often been noted that girls are less variant than boys, and perhaps there is less tolerance by girls for nonuniform achievement -- particularly if the nonuniformity is in a negative direction. A replication study should throw more light on these speculations.

The third row of Table IX shows the multiple correlations of both general self-concept and specific self-concept with specific subject achievement. All of the multiple correlations account for significantly more variance than do the correlations reported in row one between general self-concept and subject area achievement. This is even true in English.

When the multiple correlation includes an IQ measure and specific subject self-concept, even more variance is accounted for as can be seen in Table X. The multiple correlations are roughly the same for both males and females except in the case of English where much more variance can be accounted for among the females than the males.

Table X

Comparative Correlations Between Measured Intelligence and Grades in Four School Subjects with Correlations when Specific Self-Concept of Ability in Subject is Additional Variable for 513 Males and 537 Females

	Correlation Coefficients			
School	IQ - Grades		IQ, Specific S-C, and Grades	
Subject	Male	Female	Male	Female
Mathematics	.52	.57	.65	.66
English	.46	.57	.53	.63
Social Studies	.56	.58	.68	.68
Science	.56	.59	.69	.66

The general self-concept of ability scale is the better predictor of total grade point average than any of the specific subject scales. The comparative correlations are shown in Table XI.

Table XI

Correlation of General Self-Concept of Ability, and Specific Subject Self-Concepts of Ability with General Achievement for 513 Males and 537 Females

Variables Correlated	Males	Females
General Self-Concept X Total GPA	.57	.57
Arithmetic Self-Concept X Total GPA	.52*	.48**
English Self-Concept X Total GPA	.50**	.47**
Social Studies Self-Concept X Total GPA	.54	.54
Science Self-Concept X Total GPA	.55	.46**

**Significantly lower than the correlation of General Self-Concept with GPA on a two-tailed "t" test.

*Significantly lower than the correlation of General Self-Concept with GPA on a one-tailed "t" test.

There are some sex difference in the correlation of specific subject self-concept with general achievement. Among the males only the correlation of English with GPA is significantly lower than the general self-concept correlation with GPA (Arithmetic self-concept and GPA is significantly lower if the one-tailed test is used). For females, all of the specific self-concept correlations, except for social studies, are significantly less than the general self-concept correlation with GPA.

The above results appear somewhat incompatible with differences in the findings among males and females with regard to the comparative correlations of specific subject self-concepts and general self-concept with specific subject achievement. The explanation for the apparent contradiction lies in the much lower inter-correlations among the various specific self-concepts for females than for males. This is coupled with slightly higher inter-correlations in achievement in various subjects for females than for males. These matricies are given in Tables XII and XIII.

Table XII

Inter-Correlations Among the Four Specific Subject Self-Concept Scores for Males (below diagonal) and Females (above diagonal)

	1	2	3	4
1 Arithmetic Self-Concept	/	.56	.56	.52
2 English Self-Concept	.67	/	.68	.61
3 Social Studies Self-Concept	.64	.81	/	.59
4 Science Self-Concept	.68	.64	.68	/

Table XIII

Intercorrelations Among Grades in Four Subjects for Males (below diagonal) and Females (above diagonal)

	1	2	3	4
1 Grade in Arithmetic	/	.67	.69	.71
2 Grade in English	.60	/	.75	.73
3 Grade in Social Studies	.62	.70	/	.73
4 Grade in Science	.65	.62	.68	/

In summary we conclude that self-concept of ability may be differentiated into specific-subject self-concepts for males. This is not as true for females. The general self-concept of ability is a better predictor of total GPA, but in some cases, notable among males, specific-subject self-concept is a better predictor of GPA in the corresponding subject.

Tests of Hypothesis III

The third major hypothesis stated that the student's own concept of his ability would be significantly and positively correlated with the image that he perceived significant other persons held for him. The correlations were computed for both general self-concept of ability and for specific subject self-concept of abilities. The data for the student's self-concept came from the general and specific self-concept scales administered as part of the mass questionnaire. The perceived images held by significant others were obtained in interviews with 110 over- and under-achieving students, as defined in Chapter II. Each interviewee was asked to "guess" how his mother, father, best friend, and favorite teacher would have answered four questions about the interviewee's ability. The four questions were: (1) How do you think this person would rate your school ability compared with other young people your age?; (2) Where do you think this person would say you would rank in your class in high school?; (3) Do you think this person would say you have the ability to complete college?; and (4) What kind of grades do you think this person would say you are capable of getting? These questions were parallel to questions asked the student about his own ability. Although this was an interview situation, the response categories used in the general self-concept instrument were read to the respondent and he orally selected the appropriate one.

Perceived images of specific subject ability were obtained by asking each respondent to guess how each of four "significant others" would respond to a question designed to determine what grade each thought the student was capable of earning in four school subjects. These perceptions of others images of the student were compared with the student's own self-concept of his ability in the four specific subjects.

Certain limitations of the analysis should be noted. The most obvious is that the respondents were a special subgroup of over- and under-achievers, and thus did not represent a cross-section of the population. If the theory is valid it should hold for this selected sub-group, but the findings are not based on a random sample or total group of students. Data for such an analysis is being obtained in the second phase of the study.

An error may be introduced by correlating data obtained in the interview situation with other data obtained by a mass-administered questionnaire at another time. Evidence from our pretest data indicates that the correlations would likely have been higher if both sets of responses were obtained at the same time. The comparable correlations in pretest were higher than in the present case.

Differences in the number of items used to give the total scores may introduce some error. While there are eight items on the self-concept of ability scale answered by the student, his perception of significant others general image of him is based on only four questions, and the perception of others image of his specific subject ability is determined by response to only one question.

No attempt has yet been made to determine the significant others' actual images of the student's ability. We hypothesize that it is the perceived image which influences self-concept of ability, even if such perception is erroneous. The current phase of this research program will offer some evidence as to the accuracy of perception by the students. The correlations between the students' general self-concept of ability and the perceived images of four significant others are given in Table XIV.

Table XIV

Correlations Between the Student's General Self-Concept of Ability and the Images Students Perceive Each of Four Significant Persons to Hold of his Ability. (Males and Females combined: N = 110)

Student's perception of:	Correlation with Self-Concept
Mother's Image	.50
Father's Image	.52
Teacher's Image	.55
Peer's Image	.47
Total of Four Images	.58

It should be noted that when the perceptions of all significant others are combined by simple addition the total score correlates more highly with the student's own definition of his ability than do any of the perceptions of individual significant others image. This may indicate that the student's self-concept is a composite of the images reflected by many persons who are important to him. The difference between the correlations are not great, but the perceptions which students have of their peers' image are somewhat less related to self-concept than those of parents and teachers.

Correlations between specific subject self-concepts and perception of others image, shown in Table XV, are considerably lower than for the general self-concept measures. In three subject areas the student's concept of his ability is correlated more

Table XV

Correlations of the Student's Self-Concept of Ability in Four School Subjects with the Image He Perceives Four Significant Others to Hold of His Ability in These Four Subjects (Males and Females combined: N = 110)

Subject	Significant Others				
	Mother	Father	Favorite Teacher	Best Friend	Composite of Four Significant Others
Arithmetic	.31	.22	.25	.28	.31
English	.29	.15*	.18*	.30	.27
Social Studies	.38	.16*	.34	.38	.37
Science	.29	.28	.29	.26	.32

*Correlation is not significantly different from zero.

highly with the images perceived to be held by mother and best friend than with those perceived to be held by father and favorite teacher. None of these differences is statistically different, however.

The interaction theory of human learning which provides the framework of this study holds that the student internalizes the expectations that he perceives significant others hold for him and his school achievement is affected by the conception of appropriate behavior thus acquired. Although self-concept is hypothesized as the intervening variable, it is relevant to examine the correlation between the perceived expectations and actual achievement of the students. These correlations are given for the four significant others in Table XVI. The results are somewhat lower than the correlations of perceived images with self-

Table XVI

Correlations Between the Student's Grade Point Average and the Images That He Perceives Each of Four Significant Persons to Hold of His Ability. (Males and Females combined: N = 110)

Student's perception of:	Correlation with GPA
Mother's Image	.39
Father's Image	.37
Teacher's Image	.41
Peer's Image	.45
Total of four significant others images	.46

2

concept and the correlation between self-concept and achievement. The correlations by individual subjects are generally lower than the correlations with total GPA.

Supporting evidence of the relation of perceived images held by others to achievement is provided by a comparison of over- and under-achievers mean perceived image scores for each of the four significant others and for the composite score of all significant others. The results shown in Table XVII indicate that mean perceived images of the over-achievers are significantly higher than the mean perceived images of the under-achievers for all significant others except for those held by fathers. The difference in the latter case approaches significance on a two-

Table XVII

Difference in Over- and Under-Achievers Mean Perceived Images of Ability* Held-by Four Significant Others. (Males and Females Combined: N = 110)

Significant Other	Mean Perceived Image Score Over-Achievers N=65	Under-Achievers N=45	Probability of Difference
Mother	15.75	14.80	.01
Father	15.54	14.82	.10
Teacher	15.32	14.44	.02
Peer	14.85	13.64	.01
Composite of Four	61.46	57.71	.01

*Total Possible Range of Scores for Individual Significant Others is 5 to 20; for Composite 20 to 80.

tailed "t" test. These and earlier findings support the feasibility of one aspect of the second phase of this project in which an attempt is being made to raise the level of student self-concept and subsequent achievement by modifying the images that parents hold of their children's ability.

In summary we find that the third major hypothesis of the study is confirmed. The student's concept of his ability is significantly and positively correlated with the image that he perceives significant others hold for him. Furthermore these evaluations the student perceives are correlated with academic performance (GPA) in school.

Other Relevant Results

In Chapter I we raised several questions concerning the relevant variables in this study. The first question "How are seventh grade students' self-concept of ability related to measured intelligence, sex, and family socio-economic status?" has been answered in previous sections of this chapter. Others are answered in the following paragraphs.

Identification of Significant Others: The names of individuals who were Significant Others to the students were obtained in response to two questions: 1) "Who are the people who are important in your life?" and 2) "Who are the people who you feel are concerned about how well you do in school?" The questions were left completely open ended; no specifications were given as to the number or type of individuals to be listed. Tables XVIII and XIX present the responses to these questions.

Table XVIII

Percentage of Students Naming at Least One Person from Each of the Following Categories as Being "Important In Their Lives."

Other	Male Over-Achievers	Male Under-Achievers	Female Over-Achievers	Female Under-Achievers	Total
Parents	100	100	100	100	100
School Personnel	74	37	52	65	62
Adult Relatives	47	43	52	57	50
Age Mate Relatives	59	48	74	70	63
Other Adults	24	26	10	13	18
Peers	44	43	52	48	47
Nonclassifiable	18	4	10	00	9

Table XIX

Percentage of Students Naming at Least One Person from Each of the Following Categories as Being Concerned with "How Well They Do In School."

	Male Over-Achievers	Male Under-Achievers	Female Over-Achievers	Female Under-Achievers	Total
Parents	97	100	94	96	96
School Personnel	91	91	65	91	84
Adult Relatives	41	35	45	26	38
Age Mate Relatives	26	17	35	17	25
Other Adults	6	00	3	9	4
Peers	18	00	35	22	20
Nonclassifiable	00	00	00	4	1

The responses of the over- and under-achieving students to these questions indicate that parents are named more often than any other persons both as important in their lives and concerned with their school work. Teachers or other school personnel are named by more than 80 per cent in response to the latter question, but only this category approaches the nearly universal naming of one or both parent. Furthermore parents were almost always named before other persons.

There was no significant difference in the distributions of persons named as important in your life by over-achieving and under-achieving students. Neither did sex or the family socio-economic status affect the distribution of persons named in response to this item.

Over-achievers mentioned age mate relatives and peers as being concerned about how well you do in school significantly more often than did under-achievers. Females also listed peers significantly more often than males. Two additional differences which approached significance should be noted. Males tended to mention school personnel more often than females, while female under-achievers tended to mention school personnel more often than did female over-achievers.

Relations with Significant Others: The over- and under-achieving students' relations with the significant others each had mentioned were further explored in the interview. Several questions were asked concerning parents, teachers, other adults, and peers who were named earlier in the interview. Although these data are not directly concerned with the hypotheses of this study, some findings are relevant for subsequent research in the area.

The parents, mentioned by nearly all of these students in response to both significant other questions, were perceived as interested in the respondent's problems and school work. Most students reported their parents were willing to talk with them. The over-achievers were slightly more critical than the under-achievers in evaluating their parents' interest in them and more hesitant in giving an all-out endorsement of parents. The mother is seen as the major figure in the lives of most of the students interviewed, but there is a tendency for some students to prefer the parent of the same sex.

When asked with whom they talked over personal problems, females more often mentioned their mothers and males their fathers. Males gave more emphatic positive responses when asked if they discussed problems with their father, while females were significantly more likely to say "sometimes" or "never".

The parents of under-achievers were more likely to reward them in some way for good grades than were the parents of the over-achievers. The under-achievers also indicated that their parents punished significantly more often for poor grades than did parents of over-achievers. Significantly more under-achievers than over-achievers reported that their parents expected them to have difficulty in a particular subject.

Generalizations should not be made from these limited data, but they do suggest that the parental expectations for the under-achievers and over-achievers are different. It appears that the over-achievers are expected to achieve at a high level, but that conformity to this expectation and even a failure to meet the expectation was neither rewarded or punished. This may indirectly indicate that the over-achiever lives in a home which is characterized by higher expectations but is more permissive regarding deviations from these expectations.

Further questions concerning brothers and sisters revealed that females reported closer relationships to a sibling than did the males. The under-achievers indicated that they were poorer students than their brothers and sisters more often than the over-achievers. A sense of inadequacy on the part of the under-achievers is suggested when they compare themselves to their siblings. Since this evaluation was solicited through an open ended question, the respondents could have avoided such negative self evaluation. Perhaps this indicates that under-achievers have rather fully accepted a lower conception of their ability as students.

As noted in Table XVIII and XIX, teachers were mentioned by 62 and 84 per cent of the students in response to the two other questions. If a specific teacher had been mentioned in the listing of significant others, this teacher was used as the referent for later questions. If only the category "teacher" was mentioned as a significant other the interviewer asked "what teacher did you have in mind?" If teachers had not been listed as a significant others, the subject was asked to name his "favorite teacher", or the one he felt "was most concerned about how well he did in school". The teachers identified by the over-achievers were more frequently their English and social studies teachers. The males tended to select mathematics and science teachers, but neither of these differences was statistically significant at the five per cent level. All groups indicated that the teachers, when asked, would give them extra help. Impressions obtained from the interviews are that over-achievers get along better with teachers, more often think the teachers like them, and more frequently evaluate their teachers positively than do under-achievers.

Forty-eight per cent of the over- and under-achievers interviewed mentioned a peer in response to one or both significant other questions. Sixty-two per cent of those named lived in the respondents' neighborhood and 69 per cent of these friends were in the same grade at their school. Fifty-four per cent indicated that they had known this friend for three years or more and that they saw her or him daily. Most of the activities shared with the peer were outside of school, but the males were less likely than females to talk about school work with their friends.

When asked about the best friend's grades, there was a slight tendency for the over-achievers to say that their best friends did better in school (received A's and B's) than the under-achievers. Fifty-two per cent indicated that they thought that their friend would like to attend or graduate from college.

The same set of questions were repeated for a "second" best friend with essentially the same results.

Student Groups: In addition to the "significant other" questions, we asked about the groups to which the student belonged. These groups may be classified as informal peer groups and formal group memberships.

Sixty-seven per cent of the interviewees belonged to an informal neighborhood group. The males considered themselves members of such a group somewhat more often than did the females. The most frequent reasons given for the formation of these groups were similarity of interests and proximity of homes.

Seventy-eight per cent of the sample indicated that they considered themselves members of an informal school group. The females significantly more often than males reported membership in such a group. Of these 81 per cent named at least three other members of the group and only four per cent named only one other person. Eighty-seven per cent reported that all group members were in the same grade at school, while 53 per cent indicated that they shared one or more classes with most of the group. At least in part, most of these groups or cliques were newly formed after the beginning of the seventh grade. Males more frequently reported groups continuing from the sixth grade than did females. These informal school groups are somewhat independent of the neighborhood groups, since 46 per cent of those in school cliques see most of their group in school only. The major reasons given for the original formation of the groups were: mutual friends (28 per cent), similar interests (21 per cent), and previous acquaintance (14 per cent). Eighty-eight per cent of the sample reflected satisfaction with their present peer group and would not like to belong to any other; females (93 per cent), were slightly more positive about this than were the males, (83 per cent), but the difference was not significant.

Thirty-five per cent of the students interviewed did not belong to any formal organization. Of those who belonged to formal organizations, 51 per cent indicated that they were school connected. The most frequently mentioned out-of-school organization was the Scouts.

A series of questions was asked about groups to which the students would like to belong, although he had no affiliation with them at that time. Thirty-three per cent of the sample did not name such a group. Of those who said that they wanted to join another group 62 per cent mentioned school groups and 50 per cent wished to belong to sports groups. The major reason given for not having joined the group was the eligibility requirements. Fifty-four per cent of those who wished to join a new group, preferred groups that did not include their best friends. This was significantly more often the case with boys than girls. The respondents evaluation of whether or not they thought they really would join the group at some time in the future indicated that over-achievers significantly more than under-achievers thought they "really" would become members.

Models for Self: Further exploration of the persons who might be important models for the student in the development of a self-concept was made in the questionnaire administered to all seventh-grade students. This analysis is based on responses to the question, "If you could be like anyone in the world, whom would you want to be like?" These data are not comparable to the significant others identified in the interviews with over- and under-achievers, but provide some additional insight into the students' perceptions of people who may be models for them.

There were some notable differences in the proportion of boys and girls naming some categories of persons in response to the model question. The classification of responses shown in Table XX reveals that 19 per cent of the girls mentioned a peer while only 6 per cent of boys named peers. In contrast

Table XX

Responses of Seventh-Grade Males and Females to "If you could be like anyone in the world, whom would you want to be like?"

Classification of Responses	Frequency	
	Males	Females
Myself	77	87
Parent or Relative	70	94
Peer	26	86
Famous person in sports or intertainment	66	64
Famous person in public service	95	29
Other adult	23	37
Unclassifiable or Don't know	48	56
Number Students Responding*	405	453

* Not all students responded to this question which was near the end of the questionnaire.

23 per cent of the boys named a famous person in the public service, while only 6 per cent of the girls named such persons.

It should be noted that this question did not elicit the same range of responses that either of the "significant other" questions reported above. Parents were named by nearly all students as both "important in their lives" and "concerned about how well you do in school," but parents or relatives were named by only about one out of five students as someone they would want to emulate.

The students' identification of models in response to this question were analyzed by the family socio-economic status and their school achievement. For this chi-square was calculated to determine the probability of difference in the proportion naming a person in a particular category compared with all other categories.

There were no socio-economic differences among the females, but a significantly higher proportion of middle class and lower proportion of lower-class males named "myself". These data provide no evidence of social-class differences in the other persons selected as models by these junior high students.

When all the students were classified as high-middle-and low-achievers there were significant differences among both males and females in the choice of "famous persons in public service." Higher-achieving groups were more likely to name such persons. Low-achieving boys named parents or relatives less often than the higher-achieving ones, and the boys in the middle range of achievement named a peer more frequently than either the high- or low-achieving boys. Comparison of over-achievers with under-achievers as defined in Chapter II, indicated that a significantly higher proportion of over-achievers "wanted to be like" their parents than did under-achievers. While the latter were more likely to say they did not want to be like anyone or to be like themselves.

Relation of Self-Concept of Ability to other Measures of Self and Ability: The responses of 1,050 students to the Ten Statements Test and the Student Role Test provide some indication of how other measures of self-concept are related to the self-concept of ability measure and grade point average.

Two scores were obtained from the Ten Statements Test. The first was the total number of academic statements made by the student, and the second the total number of academic self responses identified as important (salient) by the student. The mean number of academic responses made on the Ten Statements Test by high-achievers was significantly greater than the mean number made by low-achievers. For this analysis the high- and over-achieving groups, identified earlier, were combined and compared to the combined low- and under-achievers among both the boys and girls. Although the mean number of academic references was not great for either group (1.6 for all high- and over-achievers and 1.1 for all low- and under-achievers), the difference would occur less than one in one-hundred times by chance among males, females, and both combined.

The Student Role Test responses were also available for 1,050 seventh grade students. Two scores were obtained from the Student Role Test. The first was calculated by subtracting the negative references from the positive references made by students in response to the question "What does a student do?" The second was calculated the same way, from the student's identification of those things he actually did as a student. The correlations between the two scores were .80 for the males and .83 for the females.

The girls mean "What does a student do?" score, 8.45, was significantly higher than the boys mean score, 7.40. The mean "What do you do?" scores were also significantly different, girls, 6.82 and boys 5.77. Both mean scores on the student role test were significantly higher for the combined high- and over-achieving students than the corresponding means for the combined low- and under-achieving group. The difference was significant at the one per cent level for both boys and girls.

Table XXI

Correlation Matrix of Ten Statement Test, Student Role Test, Grade Point Average and General Self-Concept of Ability for Seventh Grade Males (above diagonal) and Females (below diagonal)

					Males (N = 513)		
		1	2	3	4	5	6
1	All Academic References TST	-	.74	.02	.05	.22	.15
2	Important Academic References TST	.76	-	.05	.01	.15	.14
3	What Does a Student Do? SRT	.07	.05	-	.80	.21	.22
4	What Do You Do? SRT	.09	.10	.83	-	.26	.23
5	Grade Point Average	.12	.06	.17	.24	-	.57
6	Self-Concept of Ability	.14	.11	.13	.22	.57	-
		Females (N = 537)					

It is clear from the correlation matrice, shown in Table XXI that none of the scores obtained from the Ten Statements Test and the Student Role Test is highly correlated with the General Self-Concept of Ability score. Although the correlations are significantly greater than zero, the latter scale is measuring a decidedly different variable than the scores obtained from the other two tests.

Since we were concerned with identifying a student self-concept variable related to school learning, we calculated the correlation between TST and SRT scores and grade point average. Although significant positive correlations are found, (Table XXI) they are less than .25 and account for little of the variance in GPA. The self-concept of ability scale developed in this study and described earlier is much more highly correlated with school achievement.

Importance of Grades: The seven item "Importance of Grades" scale, described in Chapter II, was included in the questionnaire to determine whether self-concept of ability was independent of attitudes toward achievement as measured by this scale. The mean importance of grade scores, (which could range from 4 to 28), were 22.6 for males and 23.4 for females. Unlike self-concept of ability, the mean "Importance of Grades" score of high-achievers was not significantly different from those of low-achievers. Over-achieving males had a significantly higher mean score than low-achievers, but this difference did not hold for females. In general attitudes toward grades did not differ among high- and low-achievement groups with comparable measured intelligence.

The correlations shown in Table XXI also indicate the importance of grades is much less closely related to achievement than self-concept ability. The correlations between importance of grades and self-concept of ability are significant for both boys and girls, but the correlation for boys, .46, is higher than for girls, .33. This importance of grades variable does not greatly affect the correlation between self-concept of ability and grade point average. As noted in table XXII, this correlation is not significantly lowered when the affect of importance of grades is partialled out. Therefore, it can be concluded that self-concept of ability is independent of attitude toward achievement, as measured by importance of grades, in predicting grade point average. In view of this conclusion, the data obtained on importance of grades in specific school subjects were not analyzed.

Table XXII

Correlations Among Importance of Grades, Grade Point Average and Self-Concept of Ability for 513 Seventh-Grade Boys and 537 Seventh Grade Girls

	Coefficients of Correlation	
Variables Correlated	Males	Females
Imp. of Grades and GPA	.27	.14
Imp. of Grades and Self-Concept	.46	.33
Self-Concept and GPA	.57	.57
Self-Concept and GPA with Imp. of Grades partialled out.	.53	.56

The importance of grades data must be interpreted in light of the fact that this scale is probably not unidimensional. Although analysis indicated a scale with acceptable reproducibility, subsequent scaling of the responses revealed two scale dimensions: absolute importance of grades and competitive importance of grades. The correlation between these two scores were .48 for males and .26 for females. The analysis reported above is based on the single scale score rather than these apparently different dimensions of the importance of grades.

Analysis of the two dimensions of importance of grades by socio-economic levels of the student's family revealed that boys from higher class families had significantly higher scores than those from lower socio-economic levels. Such differences were not found among the girls. In fact higher class girls had the lowest score and middle class girls the highest scores on these scales.

Self-Concept in Relation to Best and Least Liked Subjects: A comparison of the specific subject self-concept of ability scores in best and least liked school subjects is shown in Table XXIII. This analysis clearly indicates that the students liking any of the four subjects best have higher self-concepts of ability in that preferred subject than students liking it least. Generally therefore the student's self-concept of ability is higher in whatever subject he likes best than it is in the subject he likes least.

The over-achievers in this seventh-grade group mentioned one of the four academic subjects on which we have self-concept of ability data as best liked significantly more often than the under-achievers. Among the students naming one of these subjects as best liked, social studies was named less often than mathematics, science or English. Girls were more likely than boys to mention English as best liked, while boys were more likely than girls to mention science as best liked.

Aspirations, Expectations, Self-Concept, and Achievement: The educational, and occupational aspirations and expectations

Table XXIII

Mean Specific Subject Self-Concept of Ability in Four Subjects by Best and Least Liked Subjects of Seventh-Grade Males and Females

	Mean Specific Subject Self-Concept Scores				
	Subject Best Liked		Subject Least Liked		Probability
Subject	N	Mean	N	Mean	of Difference
Arithmetic					
Males	220	28.73	58	22.78	.001
Females	210	30.02	90	24.49	.001
English					
Males	61	27.13	151	25.3	.05
Females	134	29.66	86	27.22	.001
Social Science					
Males	82	29.05	131	23.97	.001
Females	76	31.14	176	24.52	.001
Science					
Males	160	31.68	71	23.14	.001
Females	135	30.76	119	25.59	.001

were obtained from the students answering the last part of the questionnaire. Since these were the last questions some students did not complete them in the time available. If speed in completing the questionnaire is related to level of aspirations and expectations, these data are not representative of the total group. Most of the students responding - 72 per cent of the boys and 63 per cent of the girls, expect to go to college -, but even a higher proportion aspire to do so.

The mean self-concept of ability scores of those boys and girls who aspire or expect to go to college is singificantly higher than the mean scores of boys and girls who have lower aspirations or expectations. Even though these data may not be representative of the total range of educational aspirations and expectations, the consistantly significant differences among both boys and girls indicates that self-concept of ability is related to the students' educational goals.

Over-achieving students in this group indicated somewhat higher educational aspirations and expectations than the under-achievers, but not enough to produce acceptable levels of significance in all cases. Analysis of the occupational aspirations and expectations of the over- and under-achieving produced similar results. Although the former had slightly higher occupational goals, they were not significantly above the under-achievers. These criteria of educational and occupational aspirations and expectations did not therefore consistently distinguish between these achievement categories.

Intercorrelation of Variables: The correlations between the several variables on which data were obtained for the 1,050 seventh-grade students are shown in Appendix F. Not all of these correlations are relevant to the hypotheses or questions posed in this study, but some provide further insight into the relationship between self-concept, measured intelligence, and school achievement. Analysis of these relationships among the students in this population as eighth- and ninth-graders is being pursued in the current phase of the study.

Chapter IV

Summary of Results

The major results of this study may be summarized as follows:

1. A self-concept of ability scale was developed in two forms--general self-concept of ability and self-concept of ability in specific school subjects.
2. Seventh-grade girls have significantly higher mean self-concept of ability scores than seventh-grade boys.
3. Self-concept of ability is significantly related to school achievement of seventh-grade boys and girls. The correlation is .57 for each sex.
4. Self-concept of ability is positively related to school achievement in seventh-grade when measured intelligence is controlled. The correlation, with measured intelligence partialled out, is .42 for boys and .39 for girls. High-achieving groups also have a significantly higher mean concept of ability than do low-achieving groups with comparable measured intelligence scores.
5. The correlation between self-concept of ability and and measured intelligence is .46 for boys and .48 for girls. However the low .17 correlation between these variables when grade point average is partialled out indicates that self-concept differs from measured intelligence.

6. Self-concept of ability in four specific school subjects are related to seventh-grade achievement in those subjects approximately to the same degree that general self-concept of ability is related to achievement in the four subjects combined.
7. A student's self-concept of ability in a specific school subject may differ from his self-concept in another subject as well as from his general self-concept of ability. Correlation coefficients between the two scale forms indicate that somewhat different variables are being measured. Mean self-concepts of ability in English and social studies are significantly different from mean general self-concept of ability among the boys. Similar differences are found in mathematics and social studies among the girls. Specific self-concept of ability is a significantly better predictor of seventh-grade boys' grades in mathematics, science, and social studies than general self-concept of ability. Among the girls similar results are found only in social studies. *Sex and subject matter variation in* these results preclude over-all generalizations concerning differences between a specific subject and general self-concepts of ability.
8. The hypothesis that a student's self-concept of ability is positively related to the image he perceives significant others hold of him is supported when parents, teachers and peers are identified as significant others.

9. The family socio-economic status is positively related to seventh-grade students' self-concept of ability, but it does not materially affect the correlation between self-concept of ability and school achievement or other variables in this study.
10. Parents were named by nearly all students as both "important in their lives" and "concerned about how well they do in school". School personnel, other relatives, and peers were named by many in response to each question, but by smaller proportions and usually after parents were named. There were few differences in the distribution of persons named by sex, family socio-economic status, or achievement categories. The almost-universal identification of parents as "significant others" was the basis upon which they were selected as the "significant others" whose experimentally induced changes in expectations might affect the self-concepts of ability and subsequently the achievement of low achieving students. This experiment has been undertaken in the second phase of this study.
11. Self-concept of ability is not highly correlated with other student self ratings as obtained from the "Ten Statements Test" or the "Student Role Test." All correlations are less than .25.
12. Self-concept of ability is significantly related to "importance of grades", but the latter is not highly correlated with grade point average. Self-concept of

ability is independent of importance of grades in predicting grade point average.

13. The mean specific subject self-concept of ability scores were significantly higher for those students who liked a subject best than for those who liked it least. This held for both boys and girls and for all four subjects.
14. Students who aspire or expect to go to college have significantly higher mean self-concepts of ability than students with lower educational aspirations or expectations. Somewhat more over-achieving students had high educational and occupational expectations than under-achievers, but the difference was not significant.

The evidence that self-concept of ability as measured by the scale developed in this study is related to school achievement, is sufficient to justify further research in this framework. It seems clear that self-concept of ability functions independent of measured intelligence in predicting school achievement. If self-concept is subject to modification, as theoretically postulated, and if modification in the images and expectations which others hold for the student takes place, then significant enhancement of achievement may be possible. Experimental treatments designed to enhance a student's self-concept of ability and thus improve his school achievement are being undertaken in Cooperative Research Project, 1636 entitled, "Improvement of Academic Achievement through Students' Self-Concept Enhancement."

APPENDICES

A Pre-test Description
B The Questionnaire
C Reliability and Validity
D Categories Used for Socio-Economic Status Index
E Social Class, Achievement and Measurement Intelligence
F Correlation Matrix of Major Variables

APPENDIX A

The Pre-Test

Interviews and written responses to preliminary scale items by a sample of 7th grade students in the Spring of 1960 provided essential data for developing the self-concept of ability and other scales, pretesting questionnaire items, and criteria for selecting the population to be studied.

The Pre-Test Sample: School record data were obtained for one-third of the 1959-60 Oldtown 7th graders. These data included school grades for 4th through 6th grades and IQ scores in the California Test of Mental Maturity at the 4th and 6th grade level. High-, low-, over-, and under-achievers in this sample were identified in a method similar to that used in the sample studied. The range of IQ and GPA one standard error of measurement around the mean were eliminated. The average of two verbal IQ scores was used in the pre-test instead of the average of two total IQ scores used in the study sample.

This was done on the assumption that the nonverbal score would be more culture-free. Correlation analysis of the 4th and 6th nonverbal and the 4th and 6th total IQ scores for 425 students indicated that test-retest reliability was significantly higher for the total scores than for the nonverbal. For this reason the total scores in the final study were used. Since the achievement categories were selected in the pre-test on the basis of the nonverbal scores the data are not comparable with the final study.

The criteria of social class levels differed from that in the final study. A rough assignment of social class was made based on the student's residence in a census tracts which had been previously classified by predominate types of occupation and educational level. During the pre-test interviews, data were obtained on the occupation and education of parents, in addition to impressions of house type which were noted when the interviewers took the students home. Such data allowed a more precise assignment to social class which was used in all subsequent social class analyses.

Forty-nine students in the four achievement categories and a range of socio-economic were interviewed. The sample consisted of 16 over-achievers--nine females and seven males; 15 under-achieving students--six females and nine males; five high-achieving students of each sex; and four low-achieving students of each sex. The interviews were conducted at Michigan State University.

The Pre-Test Schedule: The interview schedule had two parts. First a questionnaire filled out by the student and an open-ended series of questions asked by the interviewer, who also recorded responses. The material in the pre-test consisted of the following:

Questionnaire completed by student:

Twenty-Statements Test
Student Role Test

Significant Other Individuals
Significant Academic Individuals
Significant Other Groups

16 Items on Self-Concept of Ability-General (See below.)
17 Items on Importance of Grades (See below.)
11 Items on Importance of Grades in Specific Subjects
16 Items on Self-Concept of Ability in Specific Subjects

Topics of questions asked by interviewer:

General Evaluation of Self as a Student
Background Data on Family and Family Relationships
Background Data on Persons Chosen as Significant Others or Academic Significant Others
Background Data on Significant Groups
Out-of-School Activities and Daily Schedule
Occupational and Educational Aspirations and Expectations
Study Habits
General Orientation to School, School Subjects and Teachers
Peer Group Orientation
Evaluation of Significant Other's Image of Ability and Attitude Toward the Importance of Grades.

Pre-Test Results: The pre-test data were in general used to construct an improved interview schedule and questionnaire for the study and to develop the self-concept of ability and importance of grade scales.

The self-concept of ability and importance of grade items, shown below, were subjected to Guttman scale analyses which produced the scale items used in the study. The pre-test data were analyzed for the three major hypotheses using techniques appropriate for the small sample. All hypotheses received at least partial support. Although the pre-test might on a small scale be considered a replication study for the major hypotheses, the non-comparability of IQ and social class data makes any careful comparison of results unwarranted.

Self-Concept of Ability - Pre-Test Items

1. How do you rate yourself in school ability compared with your close friends?
    - a. I am the best
    - b. I am above average
    - c. I am average
    - d. I am below average
    - e. I am the poorest
    - f. don't know

2. How do you rate yourself in school ability compared with your brother(s) and sister(s)?
    - a. I am better
    - b. I am about the same
    - c. I am poorer
    - d. I have no brothers or sisters
    - e. don't know

3. How do you rate yourself in school ability compared with those in your class at school?
    - a. I am among the best
    - b. I am above average
    - c. I am average
    - d. I am below average
    - e. I am among the poorest
    - f. don't know

4. How do you rate yourself in school ability compared to other young people your age?
    - a. I am among the best
    - b. I am above average
    - c. I am average
    - d. I am below average
    - e. I am among the poorest
    - f. don't know

5. Do you think you have the ability to complete high school?

a. yes, definitely
b. yes, probably
c. don't know
d. probably not
e. no

6. Where do you think you would rank in your class in high school?

a. among the best
b. above average
c. average
d. below average
e. among the poorest
f. don't know

7. At the graduation ceremonies in high school they give out awards and prizes for superior school work. How likely do you think it is that you would receive a prize or award?

a. very likely
b. somewhat likely
c. don't know
d. unlikely
e. most unlikely

8. Do you think you have the ability to complete college?

a. yes, definitely
b. yes, probably
c. don't know
d. probably not
e. no

9. Where do you think you would rank in your class in college?

a. among the best
b. above average
c. average
d. below average
e. among the poorest
f. don't know

10. At the graduation ceremonies in college they give out awards and prizes for superior school work. How likely do you think it is that you would receive a prize or award?

    a. very likely
    b. somewhat likely
    c. don't know
    d. unlikely
    e. most unlikely

11. In order to become a dcotor, lawyer, or university professor, work beyond four years of college is necessary. How likely do you think it is that you could complete such advanced work?

    a. very likely
    b. somewhat likely
    c. don't know
    d. unlikely
    e. most unlikely

12. Forget for a moment how others grade your work. In your own opinion how good do you think your work is?

    a. my work is excellent
    b. my work is good
    c. my work is average
    d. my work is below average
    e. my work is much below average
    f. don't know

13. Do you think your school work tends to show

    a. the best work you are capable of doing.
    b. some of the better work you are capable of doing.
    c. average work on your part.
    d. poorer work than you are capable of doing.
    e. much poorer work than you are capable of doing.
    f. don't know

14. How hard do you find you have to work in school?

    a. very hard
    b. hard
    c. average amount
    d. not very hard
    e. not hard at all
    f. don't know

15. How hard do you have to work in school compared with other students in your class?

- **a. harder than any of them**
- **b. harder than most of them**
- **c. about as hard as most of them**
- **d. not as hard as most of them**
- **e. not as hard as any of them**
- **f. don't know**

16. What kind of grades do you think you are capable of getting?

- **a. mostly A's**
- **b. mostly B's**
- **c. mostly C's**
- **d. mostly D's**
- **e. mostly E's**
- **f. don't know**

Importance of Grades - Pre-Test Items

1. How important to you are the grades you get in school?
   - a. very important
   - b. important
   - c. not particularly important
   - d. grades don't matter at all

2. How important do you feel it is to do your best in school?
   - a. very important
   - b. important
   - c. not particularly important
   - d. doesn't matter to me at all

3. How important to you are grades compared with other things in school?
   - a. grades are the most important thing in school
   - b. grades are among the important things in school
   - c. some other things in school are more important than grades
   - d. grades don't matter to me at all

4. Are grades so important that children should be punished for poor grades?
   - a. yes, definitely
   - b. yes, sometimes
   - c. not usually
   - d. no never

5. Are grades so important that children should be rewarded for good grades?
   - a. yes, definitely
   - b. yes, sometimes
   - c. not usually
   - d. no, never

6. **Is getting good grades so important that it is sometimes alright to cheat to get them.**
   - **a. yes**
   - **b. possibly**
   - **c. probably not**
   - **d. no**
   - **e. can't decide**

7. **How important is it to you to get good grades in school?**
   - **a. very important**
   - **b. important**
   - **c. not particularly important**
   - **d. grades don't matter to me at all**

8. **How important is it to you to be high in your class in grades?**
   - **a. very important**
   - **b. important**
   - **c. not particularly important**
   - **d. doesn't matter to me at all**

9. **How do you feel if you don't do as well in school as you know you can?**
   - **a. feel very badly**
   - **b. feel badly**
   - **c. don't feel particularly badly**
   - **d. doesn't bother me at all**

10. **How do you feel if you get a good grade in school?**
    - **a. feel very good**
    - **b. feel good**
    - **c. don't feel particularly good**
    - **d. doesn't matter to me at all**

11. **How do you feel if you get a poor grade in school?**
    - **a. feel very badly**
    - **b. feel badly**
    - **c. don't feel particularly badly**
    - **d. doesn't bother me at all**

12. What kind of grades do you try and get in school?

    a. mostly A's
    b. mostly B's
    c. mostly C's
    d. Mostly D's
    e. don't try to get any particular grades

13. How important is it to you to do better than others in school?

    a. very important
    b. important
    c. not particularly important
    d. doesn't matter to me at all

14. Which statement best describes you?

    a. I like to get better grades than everyone else.
    b. I like to get better grades than almost everyone else.
    c. I like to get about the same grades as everyone else.
    d. I don't care about any particular grades.

15. Which statement best describes you?

    a. I try to get better grades than everyone else.
    b. I try to get better grades than almost everyone else.
    c. I try to get about the same grades as everyone else.
    d. I don't try and get any particular grades.

16. In your schoolwork do you try to do better than others?

    a. all of the time
    b. most of the time
    c. occasionally
    d. never

17. How important to you are good grades compared with other aspects of school?

    a. good grades are the most important thing in school
    b. good grades are among the important things in school
    c. some other things in school are more important than good grades
    d. good grades don't matter to me at all

APPENDIX B

The Questionnaire

BUREAU OF EDUCATIONAL RESEARCH, MICHIGAN STATE UNIVERSITY

Junior High School Study

INTRODUCTION:

The Bureau of Educational Research at Michigan State University is doing a study to find out what 7th graders think about themselves, their school work and their future plans. You can help us to better understand young people your age by answering the following questions as honestly as you can.

Some of the questions are of the multiple-choice type with which you are familiar; others are probably different from any you have been asked before. Please read carefully the directions on each part of the questionnaire before you answer. If you have any questions, raise your hand and someone will help you.

The answers you give will not be shown to your teachers, and will in no way affect your grades. No one will see the answers you give except the research staff.

Your help in this study is greatly appreciated.

PLEASE FILL IN THE FOLLOWING INFORMATION

Name: ______________ ______________ ______________
(Last Name) (First Name) (Middle Name)

Birthdate: ________ ________ ________ **Sex: M_____ F_____**
(Month) (Day) (Year)

Name of Present School: ______________________________

What School Did You Attend Last Year? ____________________

DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO

TEN STATEMENTS TEST

There are ten numbered spaces on the page below. Please write ten answers to the simple question "Who Am I?" in the spaces. Just give ten different answers to this question. Go along fairly fast, for time is limited.

1.

2.

3.

4.

4.

5.

6.

7.

8.

9.

10.

If you finish before the time limit, please sit quietly. Do not turn the page.

STUDENT ROLE TEST

Please make twenty statements in answer to the question "What does a student do?"

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.

If you finish before the time limit, please sit quietly. **Do not turn the page.**

Circle the letter in front of the statement which best answers each question.

1. How do you rate yourself in school ability compared with your close friends?

   a. I am the best
   b. I am above average
   c. I am average
   d. I am below average
   e. I am the poorest

2. How do you rate yourself in school ability compared with those in your class at school?

   a. I am among the best
   b. I am above average
   c. I am average
   d. I am below average
   e. I am among the poorest

3. Where do you think you would rank in your class in high school?

   a. among the best
   b. above average
   c. average
   d. below average
   e. among the poorest

4. Do you think you have the ability to complete college?

   a. yes, definitely
   b. yes, probably
   c. not sure either way
   d. probably not
   e. no

5. Where do you think you would rank in your class in college?

   a. among the best
   b. above average
   c. average
   d. below average
   e. among the poorest

6. **In order to become a doctor, lawyer, or university professor, work beyond four years of college is necessary. How likely do you think it is that you could complete such advanced work?**
   - a. **very likely**
   - b. **somewhat likely**
   - c. **not sure either way**
   - d. **unlikely**
   - e. **most unlikely**

7. **Forget for a moment how others grade your work. In your own opinion how good do you think your work is?**
   - a. **my work is excellent**
   - b. **my work is good**
   - c. **my work is average**
   - d. **my work is below average**
   - e. **my work is much below average**

8. **What kind of grades do you think you are capable of getting?**
   - a. **mostly A's**
   - b. **mostly B's**
   - c. **mostly C's**
   - d. **mostly D's**
   - e. **mostly E's**

9. **How important to you are the grades you get in school?**
   - a. **very important**
   - b. **important**
   - c. **not particularly important**
   - d. **grades don't matter to me at all**

10. **How important is it to you to be high in your class in grades?**
   - a. **very important**
   - b. **important**
   - c. **not particularly important**
   - d. **doesn't matter to me at all**

11. **How do you feel if you don't do as well in school as you know you can?**
   - a. **feel very badly**
   - b. **feel badly**
   - c. **don't feel particularly badly**
   - d. **doesn't bother me at all**

12. How important is it to you to do better than others in school?
    - a. very important
    - b. important
    - c. not particularly important
    - d. doesn't matter to me at all

13. Which statement best describes you?
    - a. I like to get better grades than everyone else.
    - b. I like to get better grades than almost everyone else.
    - c. I like to get about the same grades as everyone else.
    - d. I don't care about any particular grades.

14. In your schoolwork do you try to do better than others?
    - a. all of the time
    - b. most of the time
    - c. occasionally
    - d. never

15. How important to you are good grades compared with other aspects of school?
    - a. good grades are the most important thing in school
    - b. good grades are among the important things in school
    - c. some other things in school are more important than good grades
    - d. good grades don't matter to me at all

16. What kind of grades do you try to get in school?
    - a. mostly A's
    - b. mostly B's
    - c. mostly C's
    - d. mostly D's
    - e. don't try to get any particular grades

Go On To The Next Page

Now we would like you to again answer some of the same questions, but this time about four different subjects which you are now taking or have taken in the past.

Circle the "X" under the heading which best answers the question. Answer for all four subjects. (You will have one "X" circled on each line.)

1. How do you rate your ability in the following school subjects compared with your close friends?

	I am the poorest	I am below average	I am average	I am above average	I am the best
Arithmetic	X	X	X	X	X
English	X	X	X	X	X
Social Studies	X	X	X	X	X
Science	X	X	X	X	X

2. How do you rate your ability in the following school subjects compared with those in your class at school?

	I am among the poorest	I am below average	I am average	I am above average	I am among the best
Arithmetic	X	X	X	X	X
English	X	X	X	X	X
Social Studies	X	X	X	X	X
Science	X	X	X	X	X

3. Where do you think you would rank in your high school graduating class in the following subjects?

	among the poorest	below average	average	above average	among the best
Arithmetic	X	X	X	X	X
English	X	X	X	X	X
Social Studies	X	X	X	X	X
Science	X	X	X	X	X

Go On To The Next Page

4. Do you think you have the ability to do college work in the following subjects?

	no	probably not	not sure either way	yes, probably	yes, definitely
Arithmetic	X	X	X	X	X
English	X	X	X	X	X
Social Studies	X	X	X	X	X
Science	X	X	X	X	X

5. Where do you think you would rank in your college class in the following subjects?

	among the poorest	below average	average	above average	among the best
Arithmetic	X	X	X	X	X
English	X	X	X	X	X
Social Studies	X	X	X	X	X
Science	X	X	X	X	X

6. How likely do you think it is that you could complete advanced work beyond college in the following subjects?

	most unlikely	unlikely	not sure either way	somewhat likely	very likely
Arithmetic	X	X	X	X	X
English	X	X	X	X	X
Social Studies	X	X	X	X	X
Science	X	X	X	X	X

Go On To The Next Page

7. Forget for a moment how others grade your work. In your own opinion how good do you think your work is in the following subjects?

	my work is much below average	my work is below average	my work is average	my work is good	my work is excellent
Arithmetic	X	X	X	X	X
English	X	X	X	X	X
Social Studies	X	X	X	X	X
Science	X	X	X	X	X

8. What kind of grades do you think you are capable of getting in the following subjects?

	mostly E's	mostly D's	mostly C's	mostly B's	mostly A's
Arithmetic	X	X	X	X	X
English	X	X	X	X	X
Social Studies	X	X	X	X	X
Science	X	X	X	X	X

9. How important to you are the grades you get in the following school subjects?

	grades don't matter to me at all	not particularly important	important	very important
Arithmetic	X	X	X	X
English	X	X	X	X
Social Studies	X	X	X	X
Science	X	X	X	X

Go On To The Next Page

10. **How important is it to you to be high in your class in the following school subjects?**

	it doesn't matter to me at all	not particularly important	important	very important
Arithmetic	X	X	X	X
English	X	X	X	X
Social Studies	X	X	X	X
Science	X	X	X	X

11. **How do you feel if you don't do as well as you know you can in the following school subjects?**

	doesn't bother me at all	don't feel particularly badly	feel badly	feel very badly
Arithmetic	X	X	X	X
English	X	X	X	X
Social Studies	X	X	X	X
Science	X	X	X	X

12. **How important is it to you to do better than others in the following school subjects?**

	doesn't matter to me at all	not particulary important	important	very important
Arithmetic	X	X	X	X
English	X	X	X	X
Social Studies	X	X	X	X
Science	X	X	X	X

Go On To The Next Page

13. **Which statement best describes your feeling about the following school subjects?**

	I don't care about any particular grade	I like to get about the same grade as everyone else	I like to get better grades than almost everyone else	I like to get better grades than everyone else
Arithmetic	X	X	X	X
English	X	X	X	X
Social Studies	X	X	X	X
Science	X	X	X	X

14. **In the following school subjects, do you try and do better than others?**

	never	occasionally	most of the time	all of the time
Arithmetic	X	X	X	X
English	X	X	X	X
Social Studies	X	X	X	X
Science	X	X	X	X

15. **What grades do you try to get in the following school subjects?**

	don't try to get any particular grades	mostly D's	mostly C's	mostly B's	mostly A's
Arithmetic	X	X	X	X	X
English	X	X	X	X	X
Social Studies	X	X	X	X	X
Science	X	X	X	X	X

Go On To The Next Page

We would like to know how well you like four school subjects--English, Mathematics, Science, and Social Studies. Please indicate how well you like these subjects by putting "1" after the subject you like best; "2" after the subject you like second best; "3" after the subject you like third best; and "4" after the subject you like the least.

English ____________

Mathematics ____________

Science ____________

Social Studies ____________

Now we would like you to tell us how important the grades you get in these different subjects are. Put "1" after the subject where the grade is most important; put "2" after the subject where the grade is second in importance to you; put "3" after the subject where the grade is third in importance; and "4" after the subject where the grade is of least importance to you.

English ____________

Mathematics ____________

Science ____________

Social Studies ____________

Go On To The Next Page

Please write in answers to the following questions.

1. If you could be like anyone in the world, who would you want to be like? Please indicate who this person is.

2. If you were free to choose any job you wanted, what job would you most like to have when you grow up?

3. Sometimes what we would like to do is not the same as what we expect to do. What kind of a job do you expect you really will have when you grow up?

Please circle the letter in front of the statement which best answers each question.

4. If you were free to go as far as you wanted to in school, how far would you like to go?

   A. I'd like to quit right now.
   B. I'd like to go to high school for a while
   C. I'd like to graduate from high school
   D. I'd like to go to business school or some other technical school
   E. I'd like to go to college for a while
   F. I'd like to graduate from college
   G. I'd like to do graduate work beyond college

5. Sometimes what we would like to do isn't the same as what we expect to do. How far in school do you expect you really will go?

   A. I think I really will quit school as soon as I can
   B. I think I really will go to high school for a while
   C. I think I really will graduate from high school
   D. I think I really will go to business school or technical school
   E. I think I really will go to college for a while
   F. I think I really will graduate from college
   G. I think I really will do graduate work beyond college

APPENDIX C

Reliability of Major Variables

Using Hoyt's method of computing internal consistency reliability, the reliabilities of both seventh GPA and the general self-concept scale were computed. The reliabilities of seventh year GPA (for four subjects) was .91 for males and .93 for females. (The reliabilities were computed separately for each sex using thirty-five randomly selected cases.) The reliabilities of the general self-concept total scores were .82 for males and .77 for females.

The correlation between general self-concept and GPA was .57 for each sex. Using the above reliabilities and applying a correction for attenuation gives $r_{\infty\infty}$ equal to .67 for both males and females. Such correlations account for approximately 45 per cent of the available variance. The IQ-GPA correlation was likewise corrected for attenuation (with r_{tt} for total score IQ's computed to be .65 for a random sample of 50 males and females). The $r_{\infty\infty}$ = .79 for males and .84 for females. These corrected correlations account for 62 per cent and 71 per cent of the available variance. Although the self-concept-GPA correlation accounts for less variance, it should be remembered that it accounts for variance not accounted for by the GPA-IQ correlation.

Cross-Validation: Using the average of the two total IQ scores on the CTMM and the general self-concept of ability score to predict GPA resulted in the following prediction equation for males and females:

$$X^1 = -3.0094 + .0743X_2 + .0309X_3 \text{ (Females)}$$
$$X^1 = -2.4773 + .0710X_2 + .0244X_3 \text{ (Males)}$$

Where

X^1 = Predicted 7th year June grades
X_2 = Total score on the general self-concept test
X_3 = Average of two total IQ scores

The predicted GPA was computed for a random sample of 50 males and 50 females not involved in the study, and the correlation run between estimated GPA and actual GPA. The resulting correlations were .70 for females and .71 for males. These correlations should be compared with the originally determined multiple correlations of self-concept plus IQ to predict GPA. These correlations were $R_{1.23}$ = .72 for females and .69 for males.

The cross-validation population consisted of a random sample of students who were in the same grade and school system as the students involved in the sample, but who had been originally eliminated due to insufficient data or because of race. The cross-validation sample may therefore be more heterogeneous than the sample used in the study. The original prediction equation was derived using 7th grade January grades, but the predicted grades were for June of the 7th grade. The predicted score therefore represents an additional time period of five months. That the prediction equation held so well over time, gives some indication that the prediction equation has predictive validity as well as stable reliability.

APPENDIX D

Categories for Socio-Economic Status Index

The educational level of each parent was coded as follows:

Completed grade 4 or less	1
Completed grade 5 or 6	2
Completed grade 7 or 8	3
Completed grade 9 or 10	4
Completed grade 11 or 12	5
Completed high school plus other noncollege training	6
Completed 1 or 2 years of college	7
Completed 3 or 4 years of college	8
Completed some graduate work	9

The occupational level of the parents was coded as follows:

(Note: a hierarchical ordering was assumed for only codes 9-4.)

Professional, Big Business	9
Semi-professional, Small Business	8
Clerical, Sales	7
Skilled labor	6
Service occupations	5
Semi- and unskilled labor	4
Housewife	3
Retired, unemployed	2
Other (military, student)	1

APPENDIX E

Social Class, Achievement and Measured Intelligence

Table 1

Mean Grade-Point-Average of 564 Seventh-Grade Boys by Family Social-Class and Measured Intelligence

Measured Intelligence	Social Class					
	High		Middle		Low	
	Mean GPA	No	Mean GPA	No	Mean GPA	No
High	3,07	92	3,08	94	2,87	45
Average*	2,49	25	2,37	52	2,26	35
Low	2,13	30	1,90	106	1,85	85
Total	2,77	147	2,44	252	2,21	165

* Average IQ categories includes those within the range of ± one standard error of measurement of the mean, 106. The mean IQ of the high group is 123 and the low group is 92. The means in the table are based on a one-third random sample in each category; the N's are the actual number in each category.

Table 2

Mean Grade-Point-Average of 587 Seventh-Grade Girls by Family Social-Class and Measured Intelligence

Measured Intelligence	Social Class High Mean GPA	 No	 Middle Mean GPA	 No	 Low Mean GPA	 No
High	3.45	85	3.23	117	3.17	26
Average*	2.90	35	2.78	65	2.64	43
Low	2.55	26	2.26	92	2.17	98
Total	3.14	146	2.77	274	2.51	167

* Average IQ categories includes those within the range of ± one standard error of measurement of the mean, 108. The mean IQ of the high group is 121 and the low group is 94. The means in the table are based on a one-third random sample in each category; the N's are the actual number in each category.

Table 3

Correlation Between Measured Intelligence and Seventh-Grade Point Average and Between Self-Concept of Ability and Seventh-Grade Point Average With and Without the Effect of Social Class Partialled Out

Variables Correlated	Coefficients of Correlation r_{12} M	 F	 $r_{12.3}$ (Social Class Controlled) M	 F
IQ and GPA	.61	.65	.58	.61
SC and GPA	.57	.57	.54	.53

APPENDIX F

Correlation Matrix of Major Variables*

Males N=513

1 Average Verbal IQ
2 Average Nonverbal IQ
3 Average Total IQ
4 Average Reading Score
5 Total GPA (4-6)
6 Average Arithmetic (4-6)
7 Average English (4-6)
8 Average Social Studies (4-6)
9 Average Science (4-6)
10 Ten Statements Test-Academic Responses
11 TST - Important Academic Responses
12 TST - Total Responses
13 Student Role Test - Total Score
14 SRT - Total Important Score
15 SRT - Total Number of Responses
16 Self-Concept - General
17 Importance of Grades - General
18 Self-Concept - Arithmetic
19 Self-Concept - English
20 Self-Concept - Social Studies
21 Self-Concept - Science
22 Importance of Grades - Arithmetic
23 Importance of Grades - English
24 Importance of Grades - Social Studies
25 Importance of Grades - Science
26 7th Grade Arithmetic Grade
27 7th Grade English Grade
28 7th Grade Social Studies Grade
29 7th Grade Science Grade
30 7th Grade GPA
31 Socio-Economic Status

Females N=537

* Decimals omitted